13th A. G. A. Convention Opens Oct. 12

AMERICAN GAS ASSOCIATION MONTHLY

Oct. 1931

Dealer Relations
ALEXANDER FORWARD

Coordination of Gas Industry As a Whole
R. W. GALLAGHER

Research in the Application of Gas Heat to Short Cycle Malleablizing
R. SCHNEIDEWIND

New Method for Determining Ignition Velocity of Air and Gas Mixtures
JOHN CORSIGLIA

Convention Program Replete With Important Topics

AMERICAN GAS ASSOCIATION · LIGHT · HEAT · POWER · INCORPORATED · 1919

Sixty-three employees of the Consolidated Gas Company of New York and affiliated companies appointed to serve as leaders of conference groups for an additional 1,165 employees enrolled in the Association's Course in Employee-Customer Relations

The Consolidated Gas Company of New York

THE first company to enroll a portion of its contact employees in the A. G. A. Course in Employee-Customer Relations was the Consolidated Gas Company of New York. This initial enrollment was a substantial one.

A second and larger enrollment now has been made by the same company. It calls for the training of 1,165 men and women contact employees, with 63 of this number acting as leaders of conference groups.

The experience of the Consolidated Gas Company of New York duplicates that of every company which has enrolled employees in this highly successful course—improved public relations as the result of building up in contact employees a higher level of skill in handling customer contacts.

ENROLLS AN ADDITIONAL 1,165

AMERICAN GAS ASSOCIATION MONTHLY

Allyn B. Tunis, Editor

Advisory Committee

FRANK LEROY BLANCHARD · E. FRANK GARDINER · F. HARVEY HOLDEN
EDWARD F. MCKAY · CHARLES E. WETZEL · HOWARD F. WEEKS

VOLUME XIII · OCTOBER, 1931 · NUMBER 10

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The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein.

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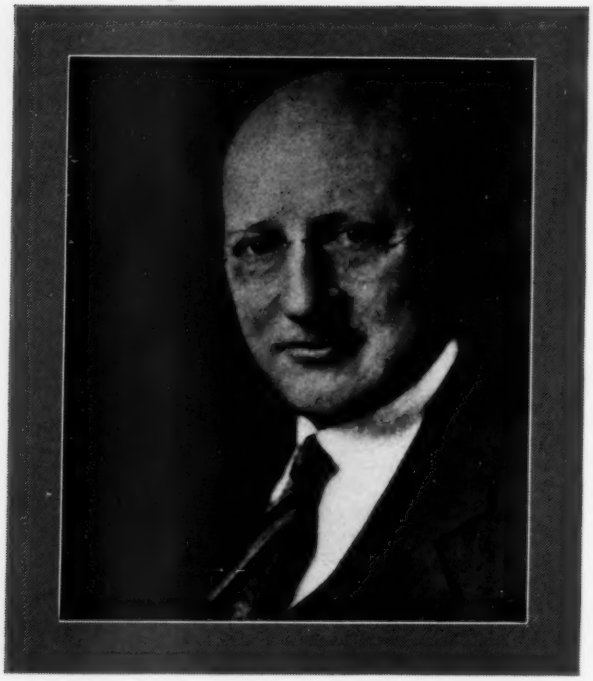


OUR OWN WHO'S WHO

Albert E. Peirce

LXXVII

ALBERT E. PEIRCE, President of Central Public Service Corporation, Chicago, and chairman of the board of the investment banking firm of Albert E. Peirce & Co., has been identified with the public utility business since 1898, beginning work with the Brooklyn Heights Railroad, Brooklyn, New York. Later he went through the student course at the Westinghouse Electric and Manufacturing Company, East Pittsburgh, after which he became electrical engineer of the bridge construction department of the Pennsylvania Steel Company; then general manager of the Indian Territory Traction Company; sales engineer for the General Electric Company in Minneapolis, and in 1907 Assistant General Manager of the Chippewa Valley Railway & Light Company at Eau Claire, Wisconsin. In 1914 this company became the Wisconsin-Minnesota Light & Power Company, of which company Mr. Peirce was vice-president and general manager. In 1917 he enlisted in the army, going abroad in December, 1917, and commanded the 37th Engineers, returning to this country in March, 1919, when he received his discharge from the Army. From that time until 1925 Mr. Peirce was in the investment banking business in New York and Chicago. In 1925 he started the Central Public Service System, which today has a property value of over $400,000,000, serves 695 communities, has a total of 527,000 gas consumers and 270,000 consumers of electricity, and over 65,000 stockholders. Mr. Peirce was born in Westfield, New York.

AMERICAN GAS ASSOCIATION MONTHLY

VOLUME XIII | OCTOBER, 1931 | NUMBER 10

Convention Program Replete With Important Topics

C. E. Paige
President

R. W. Gallagher
Vice-President

N. C. McGowen
Vice-President

Arthur Hewitt
Vice-President

W. J. Welsh
Treasurer

Alexander Forward
Managing Director

WHEN the doors swing open on the Thirteenth Annual Convention and Exhibition of the American Gas Association, at Atlantic City, N. J., this month, many high-spots will be noted on the program.

Among them will be the practical application of the Five-Year Program of Association Activities, approved last May by the Executive Board, and which becomes effective with the new Association year. This movement will be interpreted in a part of the President's address, which will be delivered by Clifford E. Paige, at the first General Session, Tuesday morning, October 13.

D. D. Barnum, president of the Boston Consolidated Gas Company, Boston, Mass., Chairman of the Committee on Association Activities, which formulated the report as finally approved, is expected to review the work accomplished by his committee.

The latest information on progress being made in the natural gas field will be described by speakers well qualified to discuss this subject. Judge H. O. Caster, General Counsel, Henry L. Doherty & Company, New York, N. Y., is scheduled to speak on "Developments in the Natural Gas Field," before the General Session of the Convention.

The session of the Natural Gas Department promises to be particularly interesting. R. W. Hendee, vice-president of the Oklahoma Natural Gas Corporation, Tulsa, Okla., will be among the speakers at that time, and the paper he will present —"Transportation of Natural Gas from the Fields to the Markets"—is expected to attract wide attention.

House cooling and summer air conditioning will form an interesting topic. Extensive and exhaustive research by the Association, which culminated in successful field tests, will be presented in a comprehensive report by N. T. Sellman, Consolidated Gas Company of New York.

Sir Francis Goodenough, C.B.E., of London, Executive Chairman of the British Commercial Gas Association, will deliver an address on "Economics of Selling Gas."

Another speaker from abroad will be J. Herbert Canning, O.B.E., Newport, Monmouthshire, President of the Institution of Gas Engineers. He will bring to the Asso-

K. R. Boyes
Secretary

ciation a message from the gas industry of Great Britain. Mr. Griswold invited Mr. Canning, who is regarded as one of the outstanding engineers of the gas industry in England, to deliver an address before one of the sessions of the Technical Section.

B. C. Forbes, of New York, well-known editor and financial authority, will touch on some financial aspects of interest to the industry in an address on "What Is Ahead."

"Problems of Dealer Relationship" will be a topic to be discussed before the General Session by O. H. Fogg, vice-president of the Consolidated Gas Company of New York. This is a report of widespread interest among gas companies and Colonel Fogg's talk is expected to draw unusual attention.

L. C. Smith
Asst. to Managing Director

Another subject of outstanding importance to the industry is that of refrigeration, which will be presented principally before the Commercial Section. In this connection, the exhibition this year will present an unusual display by Electrolux Refrigerator Sales, Inc. The display by Electrolux will occupy the entire stage of the exhibition hall in the Atlantic City Auditorium. However, besides Electrolux there will be approximately 250 other exhibitors who will show all developments and progress made recently in the development of gas appliances, apparatus and equipment.

H. W. Hartman
Assistant Manager

Indeed, this year's display of exhibits promises to eclipse previous exhibitions staged by the Association.

This will be the third consecutive year that Atlantic City has been host to American Gas Association members.

The exhibition will open and the program will get underway with sectional and departmental meetings on Monday, October 12. General Sessions open on Tuesday and will continue through Thursday. However, the Convention will not officially close until Friday noon, October 16, when the doors will swing shut on the big exhibit hall.

At the time *The A. G. A. Monthly* went to press, the tentative program was as follows:

TUESDAY MORNING
October 13, 10 o'clock
First General Session
ROOM A—ATLANTIC CITY AUDITORIUM

OPENING REMARKS BY THE PRESIDENT
Clifford E. Paige, Vice-President, Brooklyn Union Gas Company, Brooklyn, N. Y.

GREETINGS FROM AMERICAN AND FOREIGN ASSOCIATIONS
Kurwin R. Boyes, Secretary, American Gas Association.

INTRODUCTION OF DISTINGUISHED GUESTS
J. Herbert Canning, O.B.E., President, British Institution of Gas Engineers.
C. E. Paige, President.

ANNUAL REPORT OF THE TREASURER
Wm. J. Welsh, Treasurer, American Gas Association, Staten Island, N. Y.

ELECTION OF INDIVIDUAL MEMBERS

ELECTION OF HONORARY MEMBERS

ANNUAL REPORT OF MANAGING DIRECTOR
Alexander Forward, Managing Director, American Gas Association.

ANNUAL ADDRESS OF THE PRESIDENT
Clifford E. Paige

REPORT OF GENERAL NOMINATING COMMITTEE
H. C. Morris, President, The Dallas Gas Company, Dallas, Texas.

ELECTION OF OFFICERS

ACKNOWLEDGMENTS OF ELECTIONS

THE LABORATORY'S PROGRAM
George E. Whitwell, The Philadelphia Electric Company, Philadelphia, Pa.

ECONOMICS OF SELLING GAS
Sir Francis Goodenough, C.B.E., Executive Chairman, British Commercial Gas Association, London, England.

EXECUTIVE SESSION
(Member Company Delegates Only)
Election of Company Members.
Election of Directors.
Election of 1932 Nominating Committee.
Election of Resolutions Committee.

WEDNESDAY MORNING
October 14, 10 o'clock
Second General Session
ROOM A—ATLANTIC CITY AUDITORIUM

THE PREVENTION OF ACCIDENTS
C. C. Atwood, Chairman, The Brooklyn Union Gas Company, Brooklyn, N. Y.

EDUCATING GAS COMPANY EMPLOYEES
A. J. Sarre, Chairman, New Orleans Public Service, Inc., New Orleans, La.

SCIENTIFIC RATE STRUCTURE
F. A. Newton, Chairman, The Commonwealth & Southern Corp., New York, N. Y.

FUNDAMENTALS OF RATE MAKING
F. L. Daily, Chairman, Chicago, Ill.

THE ASSOCIATION'S PROGRAM
D. D. Barnum, President, Boston Consolidated Gas Company, Boston, Mass.

GAS IS THE LOGICAL FUEL
Morse DellPlain, President, Northern Indiana Public Service Company, Hammond, Ind.

PROBLEMS OF DEALER RELATIONSHIP
Oscar H. Fogg, Vice-President, Consolidated Gas Company of New York, New York, N. Y.

THE GAS COMPANY AND THE BETTER HOME
Mrs. J. Marc Fowler, Former President Illinois Federation of Women's Clubs and Member National Council General Federation Women's Clubs, Chicago, Ill.

WEDNESDAY EVENING
October 14, 8:15 o'clock
AUDITORIUM BALLROOM

Artists

Miss Hallie Stiles . . . . . Soprano

The Mendelssohn Glee Club . . . . .
Ralph L. Baldwin, Conductor

Phil Spitalny's Orchestra
Lew White . . . . . Organist

Program

PART ONE

Organ Recital
LEW WHITE

Welcome
CLIFFORD E. PAIGE, *President*

Sir Francis Goodenough

Sir Francis Goodenough, C. B. E., executive chairman, British Commercial Gas Association, who will speak at the First General Session, is one of the best known men in the gas industry of Great Britain. He is chairman of the British Government Committee on Education and Salesmanship, and is in an especially strong position to discuss this topic, since his Committee just has completed a three-year-study of that subject. He will give A. G. A. members the benefit of his experiences. Parts of the report made by Sir Francis' Committee have been incorporated in lectures both at Oxford and Cambridge Universities.

Presentation of Medals and Awards

The Charles A. Munroe Award

CHARLES A. MUNROE

For the outstanding contribution by an individual toward the advancement of the gas industry.

The American Gas Association Meritorious Service Medal

CLIFFORD E. PAIGE

For the most meritorious deed in the saving of life in the gas industry.

The Beal Medal

T. R. BEAL

For the best technical paper presented at the 1930 A. G. A. Convention.

PART TWO

Part Two of the Program will be broadcast over a national network through the courtesy of Halsey Stuart & Company of Chicago and the National Broadcasting Company.

Laudamus.....*William Owen*

Morning.....*Oley Speaks*

MENDELSSOHN GLEE CLUB

Elsa's Dream *(Lohengrin)*.....*Wagner*

HALLIE STILES

Sylvia.....*Oley Speaks*

MENDELSSOHN GLEE CLUB

Finlandia.....*Jean Sibelius*

MENDELSSOHN GLEE CLUB

Gas—Tomorrow's Fuel...*Clifford E. Paige*

Magic Song.....*Erik Meyer-Helmund*

MENDELSSOHN GLEE CLUB

MISS STILES—ORCHESTRA

PART THREE

Selections.....

HALLIE STILES

PART FOUR

Bedouin Song.....*Arthur Foote*

MENDELSSOHN GLEE CLUB

Love Me Or Not.....*Secchi*

Londonderry Air.....*Irish Folk Song*

Lift Thine Eyes....*Frederic Knight Logan*

PART FIVE

Selections.....

HALLIE STILES

PART SIX

Border Ballad.....*J. H. Maunder*

MENDELSSOHN GLEE CLUB

Summer Evening.....*Selim Palmgren*

In the Luxembourg Gardens.....
Kathleen Lockart Manning

To My Mother.....*Robert Franz*

The Omnipotence.....*Franz Schubert*

Arranged by Franz Liszt

MENDELSSOHN GLEE CLUB

MISS STILES—ORCHESTRA—ORGAN

THURSDAY MORNING

OCTOBER 15, 10 O'CLOCK

THIRD GENERAL SESSION

ROOM A—ATLANTIC CITY AUDITORIUM

INDUSTRY'S ADVANCE THROUGH RESEARCH

Dr. Zay Jeffries, Director of Research, Aluminum Corporation of America, Cleveland, Ohio.

DEVELOPMENTS IN THE NATURAL GAS FIELD

Judge H. O. Caster, General Counsel, Henry L. Doherty & Company, New York, N. Y.

WHAT IS AHEAD?

B. C. Forbes, Editor, *Forbes Magazine*, New York, N. Y.

CLOSING REMARKS

Dr. Jeffries

Dr. Zay Jeffries, who will discuss "Industry's Advance Through Research" at the closing general session at Atlantic City, is among the best known men in his field in the United States. He is director of research of the Aluminum Corporation of America, Cleveland, Ohio.

J. H. Canning

J. Herbert Canning, O. B. E., of Newport, Monmouthshire, president of the Institution of Gas Engineers, will be a prominent visitor and speaker at the Atlantic City Convention. Not only will he bring a message from the industry in Great Britain to those in America, but he also has been invited to deliver an address before the Technical Section. He is regarded as one of the outstanding men in the engineering branches in the industry in England.

Natural Gas Department

MONDAY AFTERNOON

OCTOBER 12, 2:00 O'CLOCK

ROOM A—ATLANTIC CITY AUDITORIUM

H. C. Cooper, Chairman

OPENING REMARKS

H. C. Cooper, Chairman, Natural Gas Department, Pittsburgh, Pa.

REPORT OF MAIN TECHNICAL AND RESEARCH COMMITTEE

H. D. Hancock, Acting Chairman, Henry L. Doherty & Co., New York City, New York.

REPORT OF NOMINATING COMMITTEE AND ELECTION OF OFFICERS

J. D. Creveling, Chairman, Nominating Committee, Henry L. Doherty & Company, New York City, New York.

GEOPHYSICAL METHODS OF EXPLORATION

Dr. Frederick W. Lee, Supervising Engineer, Geophysical Section, Bureau of Mines, Washington, D. C.

DISCUSSION

TRANSPORTATION OF NATURAL GAS FROM THE FIELDS TO THE MARKETS

Robert W. Hendee, Vice-President, Oklahoma Natural Gas Corp., Tulsa, Okla.

DISCUSSION

Accounting Section

MONDAY MORNING

OCTOBER 12, 10:30 O'CLOCK

ROOM D—ATLANTIC CITY AUDITORIUM

J. I. Blanchfield
Chairman

Open meeting for the study of Customers Accounting Plans. Sponsored by Committee on Development of Mechanical Office Equipment—H. E. Cliff, Chairman.

ACCOUNTING MACHINE DEVELOPMENTS

H. E. Cliff, Public Service Electric and Gas Company, Newark, N. J.

REMINGTON POST CARD CUSTOMERS ACCOUNTING PLAN

C. L. McGowan, Equitable Gas Company, Duquesne Light Company, Pittsburgh, Pa.

ELLIOTT FISHER CUSTOMERS ACCOUNT PLAN

H. F. Frey, Allentown Bethlehem Gas Company, Allentown, Pa.

MONDAY AFTERNOON

OCTOBER 12, 2 O'CLOCK

ROOM D—ATLANTIC CITY AUDITORIUM

BURROUGHS CUSTOMERS ACCOUNTING PLAN

H. B. Bearden, Laclede Gas Light Company, St. Louis, Mo.

REMINGTON-POWERS PUNCHED CARD CUSTOMERS ACCOUNTING PLAN

H. L. Dalbeck, New England Gas & Electric System, Cambridge, Mass.

HOLLERITH PUNCHED CARD CUSTOMERS ACCOUNTING PLAN

G. A. Burrows, Consolidated Gas Company of New York, New York, N. Y.

Oscar H. Fogg needs no introduction to A. G. A. members. He is scheduled to deliver the report on "Problems of Dealer Relationship" at the Second General Session, and is in a strong position to discuss this topic. Colonel Fogg, a former president of the American Gas Association, is vice-president of the Consolidated Gas Co. of New York.

O. H. Fogg

B. Forbes, who will occupy another important place on the Atlantic City program, is known personally or by reputation to most business men in this country. He is Editor of *Forbes Magazine*, New York, N. Y., and looked upon as an authority on finance. He will discuss the important topic of "What Is Ahead?"

B. C. Forbes

TUESDAY AFTERNOON

OCTOBER 13, 2 O'CLOCK

ROOM D—ATLANTIC CITY AUDITORIUM

REMARKS BY CHAIRMAN

J. I. Blanchfield, Brooklyn Union Gas Company, Brooklyn, N. Y.

REPORT OF NOMINATING COMMITTEE

J. L. Conover, Chairman, Public Service Electric & Gas Company, Newark, N. J.

REPORT OF AFFILIATED REPRESENTATIVES COMMITTEE

W. A. Doering, Chairman, Boston Consolidated Gas Company, Boston, Mass.

REPORT OF INSURANCE COMMITTEE

T. H. Prendergast, Chairman, Long Island Lighting Company, New York, N. Y.

PRESENTATION: OFFICE MANAGEMENT GROUP

"Employee Relations in the Office—A Summary," F. G. Atkinson, Chairman, Henry L. Doherty & Company, New York, N. Y.

PRESENTATION: CUSTOMER RELATIONS GROUP

Louis Stoecker, Chairman, Public Service Electric & Gas Company, Newark, N. J.

1. Address:
   Col. O. H. Fogg, Vice-President, Consolidated Gas Company of N. Y., New York, N. Y.

2. REPORT: IMPORTANCE OF OPERATING DEPARTMENT EMPLOYEE IN PROMOTING CUSTOMER RELATIONS
   Edgar Schmidt, Chairman, Consolidated Gas Co. of N. Y., New York, N. Y.

ADJOURNMENT

THURSDAY AFTERNOON

OCTOBER 15, 2 O'CLOCK

ROOM D—ATLANTIC CITY AUDITORIUM

RESUME OF PAPERS AND DISCUSSION OF MACHINE ACCOUNTING PRESENTATIONS ON MONDAY

Herbert E. Cliff, Chairman, Public Service Electric & Gas Company, Newark, N. J.

PRESENTATION: GENERAL ACCOUNTING GROUP

J. E. Kane, Chairman, Consolidated Gas Electric Light & Power Co., Baltimore, Md.

1. REPORT: SUBCOMMITTEE ON STANDARD DEPARTMENTAL FINANCIAL AND COST STATEMENTS
   H. A. Ehrmann, Chairman, Midland United Company, Chicago, Ill.

2. REPORT: SUBCOMMITTEE ON CODING OF MATERIALS, SUPPLIES AND MERCHANDISE
   D. H. Mitchell, Chairman, Northern Indiana Public Service Co., Hammond, Ind.

PAPER: GENERAL ACCOUNTING PROBLEMS ENCOUNTERED IN MATERIALLY CHANGING THE HEATING VALUE OF THE GAS DISTRIBUTED

Frank L. Griffith, The Peoples Gas Light & Coke Company, Chicago, Ill.

PAPER: STORES CONTROL AND ACCOUNTING METHODS OF A PUBLIC UTILITY COMPANY

R. I. Fletcher, Central Hudson Gas & Electric Company, Poughkeepsie, N. Y.

Commercial Section

TUESDAY AFTERNOON

OCTOBER 13, 2 O'CLOCK

ROOM B—ATLANTIC CITY AUDITORIUM

ADDRESS BY CHAIRMAN

E. R. Acker, General Sales Manager, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.

E. R. Acker,
Chairman

REPORT OF NOMINATING COMMITTEE AND ELECTION

Geo. E. Whitwell, Chairman, Philadelphia Electric Company, Philadelphia, Pa.

ADDRESS ON ECONOMICS OF SALES DEVELOPMENTS

F. J. Rutledge, The United Gas Improvement Company, Philadelphia, Pa.

DISCUSSION

To be arranged.

DEALER COOPERATION TODAY
Hugh Cuthrell, Brooklyn Union Gas Company, Brooklyn, N. Y.

GENERAL DISCUSSION

WHAT'S AHEAD IN THE HOUSE HEATING FIELD
Samuel R. Lewis, 407 South Dearborn St., Chicago, Ill.

GENERAL DISCUSSION

ADVERTISING FOR FUTURE SALES
Speaker to be announced.

WEDNESDAY AFTERNOON

OCTOBER 14, 2 O'CLOCK

MERCHANDISE ACCOUNTING
H. C. Davidson, Consolidated Gas Co. of N. Y., New York, N. Y.

DISCUSSION

SURMOUNTING COMPETITION IN THE DOMESTIC FIELD
Hall M. Henry, Utilities Management Corp., New York, N. Y.

DISCUSSION

WHAT THE GAS INDUSTRY SHOULD DO WITH GAS REFRIGERATION
Speaker to be announced.

DISCUSSION

MERCHANDISING IN THE FUTURE
(With Special Reference To Sales Training.)
Sir Francis Goodenough, British Commercial Gas Association, London, England.

GENERAL DISCUSSION

Home Service Luncheon

Shelburne Hotel

Tuesday, October 13, 12 noon

(Reservations must be made by 5:00 p.m., Monday, October 12, at A. G. A. Exhibit, Booths Nos. 2, 3, and 4 or Home Service Meeting, Monday, Room C.)

Miss Fladoes

IMPRESSIONS OF HOME SERVICE
E. R. Acker, Central Hudson Gas and Electric Corp., Poughkeepsie, N. Y.

Home Service Round Table Discussion

MONDAY AFTERNOON

October 12, 2 o'clock

ROOM C—ATLANTIC CITY AUDITORIUM

ADDRESS OF THE CHAIRMAN
Miss Karen Fladoes, Equitable Gas Company, Pittsburgh, Pa.

SYMPOSIUM ON HOME CALLS

a. A SALES MANAGER'S VIEWPOINT ON HOME CALLS
G. W. Ousler, Sales Manager, Equitable Gas Company, Pittsburgh, Pa.

b. THE HOME SERVICE PROGRAM FOR HOME CALLS
Miss Hulda Ungericht, Columbus Gas and Fuel Company, Columbus, Ohio.

HOME SERVICE RECORDS

A NEW HOME SERVICE PROJECT—KITCHEN PLANNING

a. DELINEATOR INSTITUTE SURVEY ON KITCHEN ARRANGEMENTS
Miss Grace Pennock, Delineator Institute, New York, N. Y.

b. THE A. G. A. HOME SERVICE COMMITTEE PROGRAM FOR KITCHEN PLANNING
Miss Dorothy Shank, American Stove Company, Cleveland, Ohio.

WHAT A HOMEMAKER EXPECTS OF HOME SERVICE

Industrial Gas Section

WEDNESDAY AFTERNOON

October 14, 2 o'clock

ROOM C—ATLANTIC CITY AUDITORIUM

ADDRESS OF THE CHAIRMAN
D. W. Chapman, Manager Industrial Gas Sales, The Peoples Gas Light & Coke Co., Chicago, Ill.

D. W. Chapman Chairman

REPORT OF THE NOMINATING COMMITTEE
C. H. Krausse, Asst. Manager Fuel Sales, Consolidated Gas Electric Light & Power Co., Baltimore, Md.

ELECTION

INDUSTRIAL GAS RESEARCH AND ITS RELATION TO GAS SALES
N. T. Sellman, Director of Sales & Utilization, Consolidated Gas Co. of N. Y., New York, N. Y.

THE FUEL PROBLEM AS THE MANUFACTURER SEES IT
J. M. Watson, Chief Metallurgist, Hupp Motor Car Corporation, and President of A.S.S.T., Detroit, Mich.

MEETING A NEW ERA OF COMPETITION IN THE SALE OF INDUSTRIAL GAS
H. O. Loebell, Vice-President, Combustion Utilities Corp., New York, N. Y.

THURSDAY AFTERNOON

October 15, 2 o'clock

ROOM C—ATLANTIC CITY AUDITORIUM

SALES PROBLEMS OF THE NATURAL GAS INDUSTRIAL SALESMAN
F. B. Jones, Director Industrial Gas Sales, Equitable Gas Company, Pittsburgh, Pa.

INDUSTRIAL GAS FROM THE VIEWPOINT OF MANAGEMENT
T. V. Purcell, Vice-President, Peoples Gas Light & Coke Co., Chicago, Ill.

GETTING OUR STORY TO THE EXECUTIVES IN INDUSTRY
W. D. McJunkin, President, McJunkin Advertising Co., Chicago, Ill.

Manufacturers' Section

MONDAY MORNING

October 12, 10:30 o'clock

ROOM C—MUNICIPAL AUDITORIUM

ELECTION OF OFFICERS

To comply with the requirements of the By-Laws of the Association, the Manufacturers' Section will meet to confirm the Election of Officers held at the Annual Meeting in Detroit, September 17, 1931.

E. S. Dickey Chairman

Publicity and Advertising Section

MONDAY AFTERNOON

October 12, 2 o'clock

ROOM B—ATLANTIC CITY AUDITORIUM

ADDRESS OF THE CHAIRMAN
D. M. Mackie, Commonwealth and Southern Corp., Jackson, Mich.

D. M. Mackie, Chairman

REPORT OF NOMINATING COMMITTEE
E. Frank Gardiner, Midland United Co. Chicago, Ill.

ELECTION

ADVERTISING ASPECTS OF DEALER CO-OPERATION
J. C. Barnes, New Orleans Public Service Inc., New Orleans, La.

A. G. A. PROPOSED NATIONAL ADVERTISING CAMPAIGN

George E. Whitwell, Philadelphia Electric Company, Philadelphia, Pa.

ADDRESS

Henry Obermeyer, Consolidated Gas Company of New York, New York, N. Y.

SALES PROMOTION BY RADIO BROADCASTING

"From General Advertiser's Viewpoint." Arthur Pryor, Jr., Batten, Barton, Durstine and Osborn, New York, N. Y.

"Successful Use by Manufacturer." Norman Griffith, Estate Stove Company, Hamilton, Ohio.

"Proposed Use by Gas Companies." Alfred Fischer, Semet-Solvay Engineering Corporation, New York, N. Y.

A. G. A. ADVERTISING AND PUBLICITY ACTIVITIES

Keith Clevenger, American Gas Association, New York, N. Y.

Technical Section

TUESDAY AFTERNOON

October 13, 2 o'clock

ROOM A—ATLANTIC CITY AUDITORIUM

ADDRESS OF CHAIRMAN

R. G. Griswold, Henry L. Doherty & Company, New York, N. Y.

R. G. Griswold

REPORT OF NOMINATING COMMITTEE

B. V. Pfeiffer, Chairman, The United Gas Improvement Co., Philadelphia, Pa.

ADDRESS

J. Herbert Canning, President, Institute of Gas Engineers, London, England.

ADDRESS: ECONOMIC AND ENGINEERING PROBLEMS CONFRONTING LARGE DISTRIBUTING COMPANIES UNDER PRESENT DEVELOPMENTS

W. C. Beckjord, Vice-President, Boston Consolidated Gas Company, Boston, Mass.

PAPER: GUM AND PROBLEMS ARISING FROM ITS PRESENCE IN DISTRIBUTED GAS

W. L. Shively, Koppers Research Corporation, Pittsburgh, Pa.

REPORTS SOME PROPERTIES AND CHARACTERISTICS OF COATING MATERIALS AND SPECIMENS REMOVED IN 1930

Dr. Scott Ewing, A. G. A. Research Associate, U. S. Bureau of Standards, Washington, D. C.

No better man could have been selected to discuss "Development in the Natural Gas Field" than Judge H. O. Caster, General Counsel, Henry L. Doherty & Company, New York, N. Y. He is regarded as among the outstanding speakers who will be heard at Atlantic City.

Judge Caster

THURSDAY AFTERNOON

ROOM A—ATLANTIC CITY AUDITORIUM

October 15, 2 o'clock

PAPER: GAS MIXTURES, THEIR SELECTION, UTILIZATION AND DISTRIBUTION

J. A. Perry, The United Gas Improvement Company, Philadelphia, Pa.

PAPER: RESEARCH WORK INVOLVED IN PREPARING THE CHANGE-OVER FROM MANUFACTURED TO A MIXED GAS

R. B. Harper, The Peoples Gas Light & Coke Company, Chicago, Ill.

PAPER: PROVIDING FOR PEAK LOADS

C. S. Goldsmith, The Brooklyn Union Gas Company, Brooklyn, N. Y.

JOINT PRESENTATION
ECONOMIC AND ENGINEERING SURVEY COMMITTEE

I. K. Peck, Chairman, Midland United Company, Chicago, Ill.

CARBONIZATION COMMITTEE

Charles R. Locke, Chairman. Chicago By-Product Coke Company, Chicago, Ill.

CHEMICAL COMMITTEE

W. J. Huff, Chairman. Johns Hopkins University, Baltimore, Md.

WATER GAS COMMITTEE

T. B. Genay, Chairman. United Engineers & Constructors, Inc., Philadelphia, Pa.

DISTRIBUTION COMMITTEE

O. S. Hagerman, Chairman. American Light & Traction Company, Chicago, Ill.

ENTERTAINMENT PROGRAM

Tuesday Night, October 13

President's Reception, followed by dancing. Music by Phil Spitalny's Orchestra.

Wednesday Afternoon, October 14

Ladies' Luncheon, Seaview Golf Club. Music by Spitalny's Orchestra.

Busses will leave the Traymore Hotel at noon, returning at the conclusion of afternoon's function.

Wednesday Night, October 14

Concert and presentation of medals and awards.

Dancing until 1:00 A.M.

Thursday Night, October 15

"A Night in Hawaii," featuring the South Sea Islanders and Phil Spitalny's Orchestra.

Dancing until 1:00 A.M.

All of the Seaview Golf Club's facilities will be available to the Association's guests, including golf from Monday, October 12, to Friday, October 16, inclusive, as well as card playing, tennis and putting greens.

Arrangements have also been made with the Atlantic City Country Club for A. G. A. members to enjoy golf privileges during Convention Week.

Sir Francis Goodenough Is Honored

IN the *Gas Journal*, London, September 9, 1931, the following item with reference to Sir Francis Goodenough, C.B.E., who will be one of the principal speakers at the A. G. A. Convention, next month, was published:

"An article in the 'Co-Partners' Magazine' of the Gas Light and Coke Company, dealing with the career of Sir Francis Goodenough, thus concludes:

" 'The Chief Officers of the Company, together with the Station Engineers and other friends, gathered on July 30 to say farewell to Sir Francis, and presented him with a large pale yellow Chinese silk painting as a token of their esteem and regard. The presentation was made by the Secretary, and Sir Francis briefly replied. On the following day the Governor of the Company, at the conclusion of the meeting of the Court of Directors, presented Sir Francis, on their behalf, with a set of eight Chinese paintings on silk. In making the presentation, the Governor, in his speech, referred particularly to the ideal of service of which Sir Francis has always been an exponent—an ideal which he has very successfully implanted in all ranks of his Department.

" 'Although we believe that the series of presentations and the passing of farewell resolutions to Sir Francis has not by any means yet been completed, we must conclude this short article on his career by expressing our sense of the loss which the Company has sustained, which we trust will nevertheless be compensated for to some extent by his increased activities on behalf of the Gas Industry through the B. C. G. A. Sir Francis, we understand, is going to the States in the autumn to attend the Annual Meeting of the American Gas Association, and we trust that he will have a prosperous voyage and return in safety.' "

New Method for Determining Ignition Velocity of Air and Gas Mixtures

By JOHN CORSIGLIA,
Assistant Chief Engineer,
A. G. A. Testing Laboratory

THE method for obtaining the ignition velocities of air-gas mixtures described herein were developed in connection with the Mixed Gas Research Investigation conducted by the A. G. A. Testing Laboratory under the direction of the Mixed Gas Research Committee of which F. C. Weber, Assistant Vice-President of the Brooklyn Union Gas Company, is chairman. During the initial phases of that investigation, it became increasingly evident that the chemical make-up of gases under study played a very important part in limiting changes in gas quality. This is true because of the effect of changes in chemical composition on ignition velocity. It is entirely possible to secure gases or mixtures of gases the heating value and specific gravity of which are practically identical yet their burning characteristics may differ considerably, owing to differences in chemical composition. Again, if an attempt is made to compensate for variations in specific gravity by a change in heating value, where the heat delivery to a burner remains constant, changes in chemical composition may be such as to upset appliance operation. Furthermore, the effect of chemical composition on ignition velocity is so complex that it cannot be estimated for the many gases likely to be encountered, except through a fundamental study. It was deemed essential, therefore, that a study of the ignition velocity of gases be carried along as a part of the Mixed Gas Research Investigation in order that a clearer and more comprehensive understanding might be had of the results secured. It was felt that information obtained from such a study would be particularly useful when a variation in gas quality involved changes in chemical composition. Moreover, complete data on ignition velocities should be of great value in the design of gas burners.

A survey of previous work on this subject disclosed a number of methods which are presented here in their essentials only. Two general methods have been used by other investigators in determining the ignition velocity of gases. These are the static method and the dynamic method. In the static method, the ignition velocity is determined from the time required for the flame to travel a given distance through a tube containing a known air-gas mixture at rest. In the dynamic method an explosive air-gas mixture is discharged through a small opening at such a rate of flow that the flame is just on the point of flashing back. Both of these methods are subject to considerable error and furthermore, they do not reproduce actual conditions. A somewhat better method, first conceived by Gouy, employed the Bunsen flame. In a steadily burning Bunsen flame the inner cone, sometimes called the "area of combustion," is in a state of dynamic equilibrium. When the flame is absolutely constant the ignition velocity is equal to the mixture velocity normal to the surface of the inner cone regardless of the size or shape of the inner cone. If the surface or area of the inner cone is known, the velocity of ignition can be computed from the rate of the flow of the air-gas mixture. Earlier investigators assumed the inner sections to be a perfect cone. A careful study of any Bunsen type gas flame will indicate that this assumption introduces considerable error.

More recently, a method employed by Pickering and Smith of the U. S. Bureau of Standards is based upon the assumption that the shape of the inner cone is determined by variations in velocity of the air-gas mixture at the burner port. It is assumed further that the average velocity will be found at points located $^{7}/_{10}$ of the radius of the port from the axis of the port. Using these assumptions, the data taken from a photograph of the flame is the basis of subsequent computations. Another method is that developed by Stevens at the U. S. Bureau of Standards. The air-gas mixture under test is used to blow a thin-walled soap bubble at the center of which is located an electric ignition point. On ignition, a picture is taken with a moving film and the ignition velocity calculated. The last two methods are reported to yield results in substantial agreement. The latter, however, is intricate and somewhat tedious in its method of application.

It appears from a study of the above mentioned methods that the measurement of the inner cone surface should be most satisfactory, if for no other reason than that it most nearly represents actual conditions found with the ordinary gas burner.

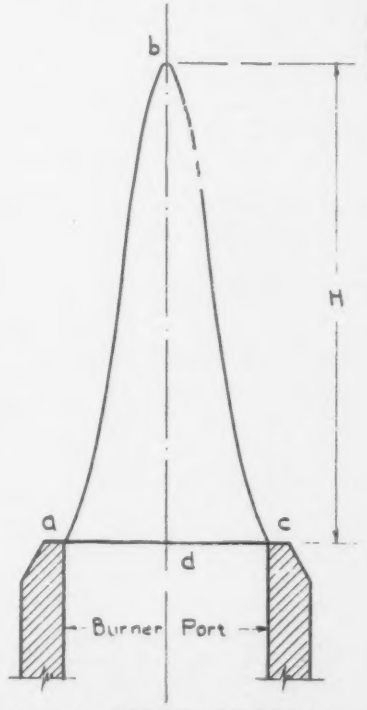


Figure 1. Magnified projection of inner cone of flame

All methods of this type studied are based upon assumptions regarding the shape of the inner cone. In order to remove the possibility of error through such assumptions, the A. G. A. Laboratory devised a method of measuring the exact surface of the inner cone regardless of its shape. Briefly this method involves projecting a magnified image of a photograph of the flame on a frosted glass screen, tracing the projection of the inner cone in pencil, and measuring the height, length of the side and area. These measurements make possible the calculation of the area of the inner cone without recourse to any assumptions as to its shape. The basis of the calculations is derived as follows:

The inner cone of a gas flame is represented in Figure 1. The area abcd represents a vertical cross-section through the center of the inner cone which has been magnified and projected on the frosted glass screen. If this area be represented by A, then $\frac{A}{2}$ represents the area c b d. The average distance of the side bc of the cone from the axis bd is $\frac{A}{2H}$. The surface of the magnified inner cone is equivalent to the surface generated by revolving the line b c of a length L about and parallel to the axis bd, using the distance $\frac{A}{2H}$ from the axis as the radius. If S represents the area of the surface of the magnified cone, then

$$S = \frac{2\pi A}{2H} \times L = \frac{\pi AL}{H} \qquad (1)$$

Equation (1) represents the magnified area of the surface of the inner cone of the flame. If the image is magnified M times, the actual dimensions of the inner cone of the flame, as photographed, are:

$\frac{A}{M^2}$ = actual area of cross section of inner cone,

$\frac{H}{M}$ = actual height of the inner cone, and

$\frac{L}{M}$ = actual length of the side of the cone.

To obtain the actual surface area (s) of the inner cone as photographed, substitute the above valves for the magnified values in equation (1) and,

$$s = \frac{\pi\ (A/M^2)\ (L/M)}{H/M} = \frac{\pi LA}{HM^2} \qquad (2)$$

The area (A) is measured by a planimeter and is given in square inches. The height H is measured with a scale graduated to 1/100 of an inch and is given in inches. A map measure, graduated to 1/32 of an inch is used to obtain the length L of the line bc.

In calculating the ignition velocity let,

u = ignition velocity, centimeters per second,

V = total volume of air and gas mixture, cu.ft. per hour

$\frac{1728}{3600}$ = factor for converting cu.ft. per hr. to cu.in. per sec.

2.54 = factor for converting inches to centimeters, and

s = surface of inner cone, sq.in.

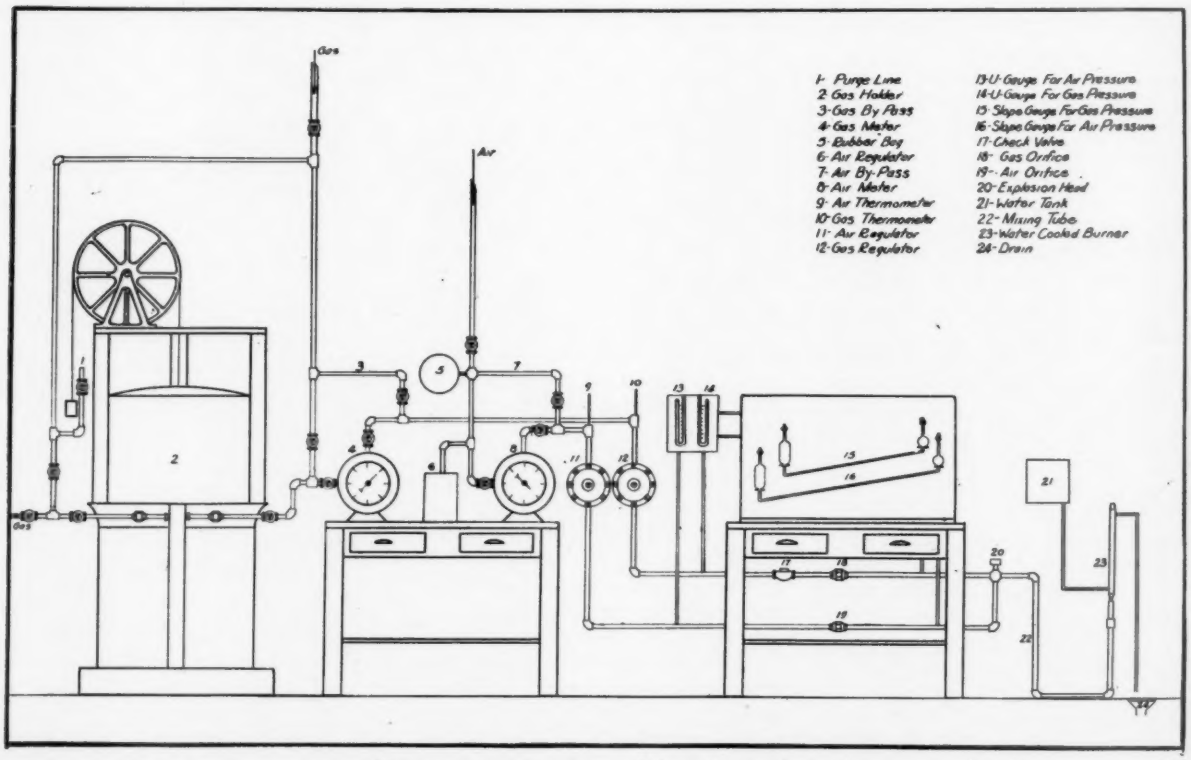


Figure 2. Apparatus to control flow of gas and air

Then the ignition velocity is

$$u = \frac{V}{S} = \frac{(2.54)^3\ (1728/3600)\ V}{(2.54)^2 s} = \frac{1.2192V}{s} \quad (3)$$

Combining equations (2) and (3)

$$u = \frac{1{,}2192\ V}{\pi LA/HM^2} = \frac{1.2192\ VHM^2}{\pi\ LA} \quad (4)$$

The following is a condensed description of the equipment used in obtaining the information necessary to compute the ignition velocity from equation 4. This apparatus is installed in a special test room in which the walls are painted dull black.

The arrangement of the apparatus used to control the rates or flow of air and gas is shown in Figure 2. A 10 cu.ft. meter prover (2) was used for storage and mixing of gases to be tested. The crown of the prover was tapped and to it attached a vacuum line by which the crown could be completely evacuated when necessary. Two one-tenth cu.ft. wet test meters (4 and 8) were used to meter the air and gas respectively. Pressure regulators (11 and 12) were placed in the air and gas lines. In addition, two easily changeable brass plates (18 and 19), tapped for spuds with various sized orifices, were used to control the air and gas flow. Two differential gauges (15 and 16) having a slope of 6 to 1 were used to indicate the drop in pressure across the orifices. A check valve (17) prevented the air from backing up in the gas line and an explosion head (20) with a celophane diaphragm was used to prevent damage to the equipment in the event of flash-back. Three interchangeable water-cooled burners tapered at the top were used. They were circular in cross section with internal diameters of 0.15, 0.25 and 0.356 inch. The kind of gas under study was the governing factor in the selection of the burner (23) to be used.

Figure 3 shows the arrangement of apparatus used for photographing the inner cone of the flame and projecting the image on a frosted glass screen for measurement. The camera was used as a projector by removing the extension on the back and placing it on the lower portion of the table. A 250-watt lamp, placed in a 4-inch tee was fitted with an upright 4-inch pipe for venting, and a horizontal pipe for concentrating all light on a condensing lens. The lens was placed between the lamp and the image to be projected. To preclude distortion of the image, the projector and the surface of the projection screen must be level, and the reflecting mirror at an angle of 45 degrees. The screen is of plate glass frosted on the upper surface.

In the use of this equipment for determining the ignition velocity of any air-gas mixture the procedure involves five definite steps. They are:

1. Measuring and proportioning the air and gas in the mixture in order to determine the air to gas ratio.
2. Photographing the flame (inner cone).
3. Projecting the photograph of the flame on the ground glass screen.
4. Measuring the dimensions and area of the projection and calculating inner cone surface.
5. Calculating the ignition velocity from the above data.

The first step in the procedure is outlined as follows and will be made clear by reference to Figure 2: After the prover is filled with the gas or mixture of gases to be tested, the valves to the right of the prover and the inlet and outlet (4) valves to the meter are opened. The regulator (12) is adjusted to give the desired flow of gas through the gas orifice meter into the mixing tube (22) and through the burner (23). The next step is to open the valve in the air line until bubbling occurs in the air regulator (6), which is an open end pipe immersed in a container of water. The inlet and outlet valves to the air meter are then opened and the regulator (11) adjusted to give a flow of air through the air orifice meter (19) into the mixing tube (22) where the mixing of air and gas takes place.

The by-passes (3 and 7) were originally placed in the assembly so that, after the orifice meters were calibrated against the wet meters, it would not be necessary to use them as they might cause fluctuations in the flow. However, with the diaphragm regulators and the orifices both on the outer side of the meters, fluctuations in pressure were not noticeable.

The procedure in obtaining the gas and air rates is to set the regulators to give a soft flame at the start and then increase the air by steps until either flash-back or blowing occurs. This is done by keeping the differential pressure across the gas orifice constant and increasing the differential pressure across the air orifice slightly for each exposure. As the air rate or air-gas ratio is increased, the total volume increases, but the ignition velocity of the gas increases much faster than the volume, making the flame harder and shorter until flash-back may occur. This tendency may be offset by increasing the quantity of both air and gas. After the maximum ignition velocity is reached, the inner cone becomes longer and the outer one begins to disappear, as the rate of air

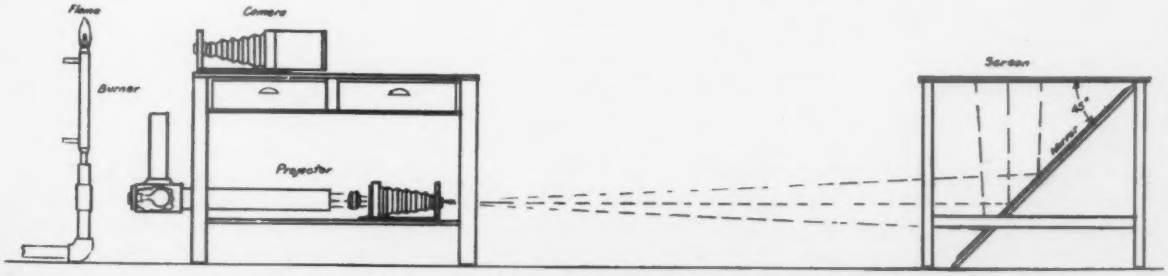


Figure 3. Apparatus for photographing and projecting inner cone of flame

flow is increased. A continued increase in the air rate will eventually cause the flame to blow from the burner port. Blowing may be prevented by reducing the quantity of both air and gas.

For each air-gas ratio setting, the air and gas rates are obtained by timing the wet test meters. The orifice meters and differential guages are used as indicators to show that a constant rate of flow is being maintained, and for obtaining uniform changes in either gas or air rates.

It is essential that the temperature of the various air-gas mixtures be the same. Research work in Germany indicates that the ignition velocity varies approximately as the square of the absolute temperature of the mixture prior to combustion. In the work done at the Laboratory, the mixture temperature was held at 70° F. ± 2°.

The second step in the procedure consists of photographing the flames. Photographs are taken on 5 x 7 inch plates with seven to eight exposures of flames and one of a scale (to determine magnification) on each plate. Before making an exposure ample time is allowed after each setting of the differential gauges for the mixing tube to become thoroughly purged.

Since different gases produced flames of different colors, it was necessary to select plates with emulsions sensitive to the color produced by each gas. The emulsions required were available in commercial plates, as follows: (1) Eastman "Speedway," which is sensitive to all colors except green, yellow and red, (2) Eastman "Orthochromatic," being sensitive to all colors except red, and (3) Wratten "Panchromatic," which is sensitive to all colors. A few examples will illustrate the reasons for using various emulsions, depending on the particular color of the flame. The inner cone of the hydrogen flame, for instance, which is blue only, but quite luminous at low air gas ratios due to dust particles in the air, will photograph on Orthochromatic or Panchromatic plates, but the luminous dust particles obscure the inner cone. It was found that the best results on hydrogen were obtained with Speedway plates, which are sensitive to blue and purple. Ethylene and the fuel gases producing a green inner cone photograph very well on Orthochromatic plates.

The length of time required for an exposure varies with the color of the flame. Flames with a well defined inner green cone, such as ethylene and carburetted water gas, require an exposure of only two to four seconds. Natural gas and coke oven gas flames, in which the color of the inner cone is less intense, require four to ten seconds' exposure. The flame produced by hydrogen, which is almost invisible at high air-gas ratios, requires a four- to thirty-minute exposure on the Speedway plate.

After the photographic plates have been developed and dried, they are placed in a special attachment on the back of the camera and used as shown in the projector assembly in Figure 3. They are then projected as an ordinary lantern slide on a mirror, which is set back a distance to give an image magnified approximately ten times on the frosted glass surface of the table top. This image is outlined in pencil and then measured.

It has been stated that burners of three diameters were used. Since some question might exist as to the possible effect on the results secured when using burners of different diameters, ignition velocity curves for several gases were obtained using the three burners previously described. A direct comparison showed definitely that such differences as could be noted were obviously accountable for within the limits of experimental error. This point is of interest in that the size of burner to be used may be selected to best fit the type of gas being studied.

The usual method of calculating inner cone surfaces has been by measurement of the cone height either by a cathetometer or from photographs. As pointed out before, this method is based upon the assumption that the inner cone of the flame is a true geometric cone. In order to compare the results obtained in this manner with those of this investigation, some calculations have been made from actual data.

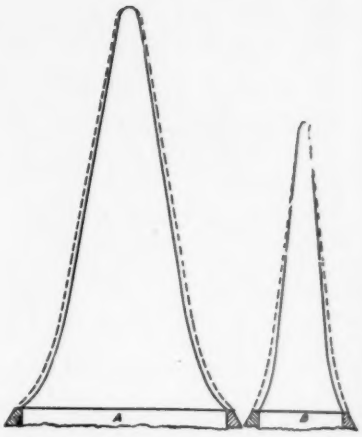


Figure 4. Effect of air-gas ratio and Chemical composition on shape of inner cone

Figure 4 represents vertical cross sections through the center of inner cones with two different burners. In A, the dotted line represents a drawing of the image of the inner cone as projected on the frosted glass screen from a photographic plate. The gas under test was ethylene mixed with 59.6 per cent of the air theoretically required, while the total volume of air and gas mixture passing through the burner was 10.00 cu.ft. per hour. The solid line represents the inner cone of a flame using the same gas and burner and having exactly the same cone height, but with 100.2 per cent theoretical air and 18.46 cu. ft. of air gas mixture passing through the burner per hour. Here the cone height, gas, and burner size were the same but the air-gas ratio and total volume of gas flowing through the port varied. With a high air-gas ratio, or hard flame, the base of the cone had the same diameter as the port. With a low air-gas ratio, or soft flame, the diameter of the base of the cone was greater than the diameter of the port.

In B. of Figure 4, the small burner was used. The solid line represents the inner cone of a hydrogen flame with 68.4 per cent of the theoretical air and a total volume of air and gas mixture flowing through the port of 26.3 cu.ft. per hour. The broken line represents the inner cone of a carburetted water gas flame with 86.5 per cent of the theoretical air required and a total volume of air gas

mixture flowing through the port of 6.31 cu.ft. per hour. In this case two different gases having the same cone height were used with the same size burner, but with their areas of combustion unequal. The base of the inner cone of the carburetted water gas flame was larger than the burner port, while the base of the inner cone of the hydrogen flame was the same size as the burner port. This shows that the method used by Ubbelohde and de Castro (Thesis, Karksruhe, 1905) was in error, as the ratio between cone height and surface of combustion for various air gas mixtures and different gases is not constant. Figure 5 shows the ignition velocity of hydrogen obtained by different methods of measuring the inner cone. The ignition velocity shown by solid lines were obtained by the method of measurement used by the A. G. A. Laboratory. The broken line shows the results obtained when calculated from the cone height and port size.

Ignition velocity curves, secured by the method outlined, of several common gases and a number of simple gases, including the principal constituents of city gases, are shown in Figures 6 and 7. Essential data affecting the several gases are shown in Tables I and II. It will be noted that ignition velocity is plotted against percentage of theoretical air required. This practice is followed for two reasons: (1) The adjustment of burners is usually made to give a certain type of flame, obtained by premixing a rather definite proportion of the total air requirement as primary air; and (2) where the gases vary widely in total air requirement, a representation of the results by percentages of gas in the mixture would obviously offer no basis of comparison.

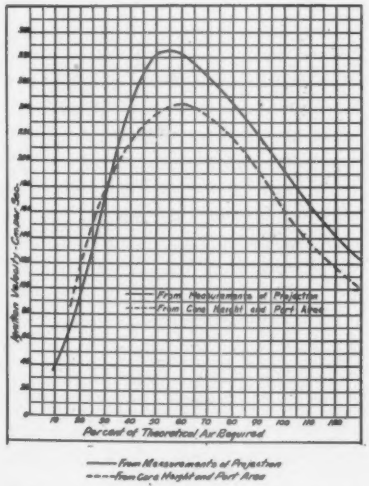


Figure 5. Ignition velocity by two methods

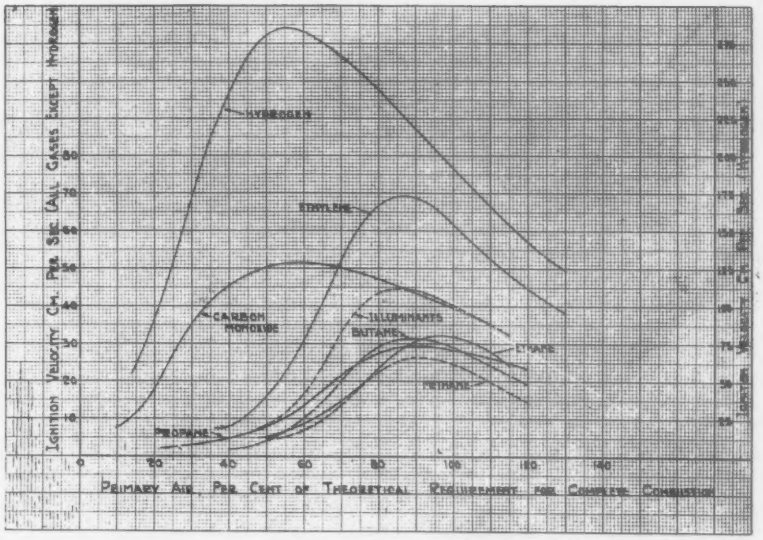


Figure 6. Ignition velocity of various simple gases

It can be seen that for the same percentage of primary air, or same type of flame, a considerable range of ignition velocities is embraced by the gases shown. A notable characteristic is that the maximum ignition velocity generally is not found at 100 per cent primary air but varies depending on the gas.

The ignition velocity curves shown in Figures 6 and 7 are but a few of the many similar curves established during the course of the Mixed Gas Research Investigation. About one hundred and fifteen ignition velocity curves on various gases and mixtures of gases have been determined. These have been particularly useful in the study of many gas mixing problems.

The determination of ignition velocity of air-gas mixtures as described involves the dynamic method

TABLE I

DATA ON GASES IN FIGURE 6
(Gas and Air Saturated with Water)

Gas	*Heating Value B.t.u./Cu.ft.*	*Specific Gravity (Air = 1.0)*	*Theoretical Air Required Cu.ft./Cu.ft. of Gas*
Hydrogen	325	0.0695	2.39
Carbon Monoxide	323	0.9672	2.39
Ethylene	1639	0.9748	14.35
Ill. {25% C_6H_6 / 75% C_2H_4}	2153	1.404	19.7
Methane*	1049	0.592	9.77
Ethane†	1713	1.04	16.05
Propane	2586	1.563	23.88
Butane‡	3170	1.95	30.7

* Analysis of gas used: 90.8% CH_4, 5.8% C_2H_6, 0.5% Ill., and 2.9 inerts.
† Analysis of gas used: 90% C_2H_6 and 10% hydrocarbons including CH_4, C_3H_8, C_3H_6, and C_2H_4.
‡ Analysis of gas used: 71.0% Nor-C_4H_{10}, and 24.8% Iso-C_4H_{10} and 4.2% C_3H_8.

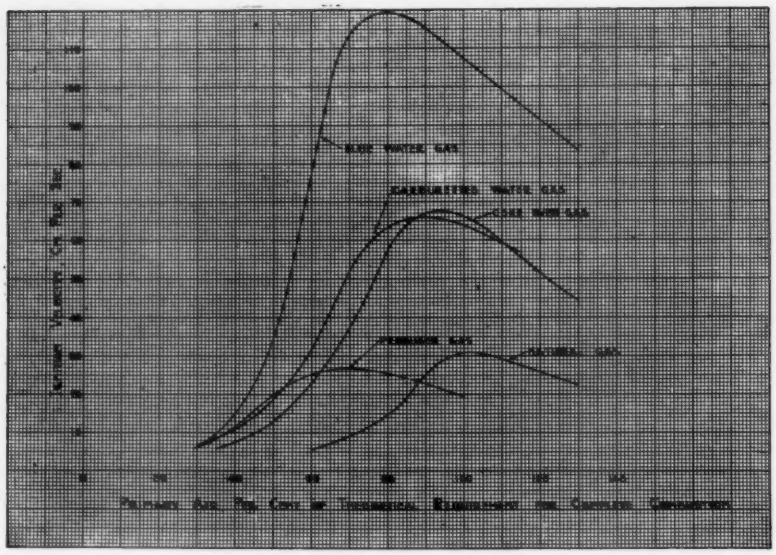


Figure 7. Ignition velocity of common gases

employing the actual area and height of the inner cone of a Bunsen flame. This procedure most nearly represents the actual conditions prevailing in the utilization of gas. A thorough study of the method shows it to be simple and fairly rapid in application. The method, furthermore, is accurate and yields results which are easily reproduced well within the limits of experimental error.

TABLE II

DATA ON GASES SHOWN IN FIGURE 7

(Gas and Air Saturated with Water)

	Producer Gas	*Blue Gas*	*Carburetted Water Gas*	*Coke Oven Gas*	*Natural Gas*
Heating Value, B.t.u./Cu.ft.	143	282	560	525	1123
Specific Gravity (Air = 1.0)	0.908	0.607	0.640	0.377	0.693
Analysis, Per cent CO_2	0.7	5.0	2.6	2.3	0.1
Analysis, Per cent Ill.	0.2		10.1	3.5	0.0
Analysis, Per cent O_2	0.4	0.7	0.9	0.4	0.3
Analysis, Per cent H_2	6.9	47.5	35.4	57.4	
Analysis, Per cent CO	34.2	38.2	30.8	7.2	
Analysis, Per cent CH_4	0.5	0.3	11.0	23.1	71.1
Analysis, Per cent C_2H_6			0.9	0.4	22.3
Analysis, Per cent N_2	57.1	8.3	8.3	5.7	6.2
Total	100.0	100.0	100.0	100.0	100.0
Air Required/Cu.ft. of Gas	1.05	2.04	4.72	4.49	10.03

The Therm in Japan*

By TAKAMARO AKIYAMA,
Accounting Department, Toho Gas Company, Limited, Nagoya, Japan

UNDER the system of charging by the unit of heat supplied to the consumers in Chita territory, served by Chita branch of the Toho Gas Company, we had filed the first application in this country with the Minister of Commerce and Industry, and the office granted the permission for the system in December, 1930, as you learned from the *Gas Journal* (London). We adopted actually the new system in Chita territory at the beginning of February, 1931. We are making extensive preparations for extending the system to other territories such as Nagoya, Fukuoka, Nagasaki and so on.

By the way, the Tokyo Gas Company has also applied for authority to adopt the therm system in Tokyo territory, and it is expected that the new system will become effective at an early date.

As you understand, under provisions of law, our Gas Regulation Act, the Commerce Office shall require the gas companies to declare the calorific value of the gas. In a word, we may say that we are selling to the customers the quantity of gas in calorific value. Most of the gas companies here have declared 3,500 k.g. cal.† or so (per cubic metre) as the heating value of gas. Our company had submitted an application for permission to adopt the new system in Chita territory as its trial and to increase the declared calorific value from 3,560 k.g. cal. to 4,500 per cubic metre.§ The Commerce Office recognized that our application was not contrary to the letter and spirit of the existing Gas Regulation Act, and authorized the adoption of the new system, giving a special order.

The order reads:

"The Toho Gas Company shall present to the authorities concerned the copies of charts (records of the calorific value) produced by means of the automatic recording calorimeter.

"If in any month the average calorific value of gas supplied by the Toho Gas Company is less than the declared calorific value, a sum of money (that may be amount by which the revenue has been increased) shall be applied towards a reduction in the price of gas at a proper time."

I take the opportunity of informing you that in our department we are now studying a rate system based on the services and faced with practical problem of how to allocate expenses to each item corresponding to the service.

—A. G. K.

* This description of the adoption of the therm method of charging for gas in Japan has been prepared from information kindly furnished by Mr. Akiyama to A. G. A. Headquarters.

† Approximately 370 B.t.u. per cu.ft.
§ Approximately 475 B.t.u per cu.ft.

Photograph taken at night without flashlight. This is a splendid example of high-pressure gas lighting

London Emphasizes Gas As An Illuminant

AT the International Illumination Congress an unusual opportunity was provided last month in London for emphasizing the value of gas as a modern illuminant. The *Gas Journal* (London) under date of September 9 said that gas and electricity have proceeded hand-in-hand in carrying out a program which must benefit both.

Further, the *Journal* stated:

"Our industry can never resign its claim to a goodly share of the lighting load, as there are so many conditions in which this claim is justified, but that is no reason why it should not progress side by side with electricity, as has been the case elsewhere. By the flood lighting of St. James' Park, and by the Class A lighting demonstration in Whitehall, gas fully establishes its right to a place in the front rank as an illuminating agent. Neither installation could be excelled by any other means.

"Verily, Tuesday was to be a night with the past; for, after rejoining the boats, we were brought to the Tower of London, which had been specially lighted for the occasion—and lighted in such a manner as to take us back through the centuries. No shades of the Gas Industry's pioneers here; but scenes which must have impressed

Landscape lighting by gas in St. James' Park

themselves indelibly upon the memories of all the visitors. Those who saw for the first time on this occasion, with the aid of the Illuminating Engineer, the awe-inspiring stronghold with which the history of England is so closely interwoven, are indeed to be envied. Then, having seen what an artist in illumination could do with this ancient pile, the steamers were once more requisitioned to show us the flood lighting and illuminations from the river. Beginning with the Tower Bridge, and ending with Thames House, the sight was a never-to-be-forgotten one. A short drive to see other illuminated buildings concluded a tour which had been made without a hitch.

"Now in regard to street lighting in general, the South Metropolitan Gas Company strongly criticize the 1927 Street Lighting Specification of the British Engineering Standards Association, on the grounds that the specification took no account of the average illumination of the roadway, but was based on a minimum illumination of a test point which in most cases is situated at the edge of the kerb, and that the classes defined by the specification did not necessarily represent the relative merits of the installations. This is what the authors of the paper under review have to say about the matter: 'Our reorganization of the street lighting of South London and the development of highly directional systems of street lighting, with which we have been in keen competition in South London during this reorganization, suggest the necessity for a revision of the specification, in which the average illumination of the roadway shall be considered as at least equal, if not greater, in importance to a minimum illumination at a test point situated, in most cases, at the edge of the kerb.' They exemplify mathematically why both test point and average illumination require to be taken into account in a specification of street lighting, as an increase of the former produced by an increase of mounting height must result in decreased average illumination of the roadway. It is shown that this matter of average, as contrasted with B. E. S. A. test point, illumination was of considerable importance in the illumination of the test mile of road in Lewisham, to which we have already referred.

"Another important point made in the paper concerns the principle of fixed air and gas burners adopted by the South Metropolitan Gas Company, at the suggestion of Dr. Charles Carpenter, twenty-one years ago and adhered to ever since. The authors state that the half-hearted attempts which were formerly made to cope with changes in the composition and properties of gas by the provision of devices for the adjustment of the rate of supply of gas to the burner, and for controlling the induced primary air current were never very successful. 'Such devices are now quite unnecessary, as gas burners can once and for all be suitably designed, in the first place, for use with gas of the declared calorific value—that is to say, gas burners can now have as fixed and definite a construction as electric lamps.' It is our opinion that the Gas Industry as a whole will come to share this view and adopt the fixed air and gas principle."

200-Year-Old Mansion Goes Modern with Gas

Ancient home equipped with gas

ONE of the landmarks of Brooklyn, located on East 5th Street, near Bay Parkway, is an old colonial home which excites admiration from all who view it.

Not at all out of place amid its up-to-date neighbors, the charm of this 200-year-old house is enhanced by its magnificent surroundings. A wonderfully well kept lawn, colorful flower beds and lofty old trees all tend to make its setting a veritable garden spot.

Considerable historical significance is attached to the old mansion which is known as the Bergen Manor House. It was occupied for many years by Adrian Bergen whose family traced their ancestry back to Hans Von Bergen who came to America in 1633. Herr Von Bergen married Sarah Rapalye, the first female child born of civilized parents within the bounds of the colony of New Netherlands, now the State of New York.

The Manor House is now owned and occupied by Samuel W. Maguire who has left the appearance of the beautiful old dwelling intact. He has, however, modernized it insofar as comforts and conveniences are concerned. The house is now heated with an automatic gas-fired boiler equipped with one of the newer gas ranges and boasts of gas refrigerator, all installed by the Kings County Lighting Company.

Coordination of Gas Industry As a Whole*

R. W. Gallagher

By R. W. GALLAGHER,
Vice-president, American Gas Association, Cleveland, Ohio

IT is quite evident that those in attendance at this meeting appreciate the value, if not absolute necessity, of the proper coordination of effort within our industry. Otherwise, you would not be assembled here in conference today. Consequently, I shall not dwell at any length on the value of such efforts but shall endeavor to point out some ways in which, I believe, greater coordination of interests could logically be brought about, and review some of our past experiences with the hope that we may profit in the future by avoiding some of our mistakes of the past.

Without a doubt we are now passing through one of the most unusual periods ever experienced by our industry. I refer particularly to the phenomenal expansion of our service which is taking place from certain natural gas fields, the growing use of higher hydrocarbon gases, and the numerous developments being effected in the design and construction of gas appliances. These items coupled with the fact that business in general is passing through one of the most severe depressions ever recorded in American history combine to present a very unusual situation. Such a combination of circumstances calls for more caution, an exhibition of greater courage, and the application of better business judgment than ever before.

Gas appliance manufacturers, particularly during the past two years, have made notable progress in bringing out new models and designs which should possess added sales appeal and open new markets for our product. The Association's Testing Laboratory has also made splendid progress in bringing about a greater degree of standardization of domestic gas equipment and in improving its performance. Furthermore it has likewise completed considerable research that should be of great value in meeting future production, distribution and utilization problems. All of these engineering developments will assist in opening new markets, improve the quality of our service, and aid in promoting the general use of city gas. Despite these facts, however, our industry's position is not all that could be desired and in far too many instances we find manufacturers as well as some of the smaller utilities facing financial difficulties. These conditions and others that might be pointed out indicate very definitely a lack of proper coordination of effort.

Your Chairman, Colonel Dickey, combined in a few words recently, the entire truth of that thought when he said, "Be certain of this fact—permanent progress always has been and always will be closely related to wholehearted cooperation." Without sincere cooperation on the part of the manufacturer, the utility, and in short, the entire gas industry, the full potential of our opportunity toward greater progress and permanent growth will not be realized.

I have always felt that a very common tendency was to adopt too limited a viewpoint in analyzing our competitive position. As far as I can determine, we are in competition for our share of the customer's dollar with every known form of luxury or human necessity. Consequently, if we overlook this fundamental fact, we are, in effect, minimizing the importance of our competitive situation and, in the last analysis, closing the door to many business opportunities.

The Association's Executive Board, during its annual Spring Conference, held in Atlantic City on May 2, through the adoption of its cooperative merchandising principles, made an excellent start in dealer cooperation. In this problem of dealer relationship, it is quite natural to suppose that manufacturers as a group hold some opinions in respect to its solution. The gas industry would like to know what those opinions are, and it is, therefore, with considerable satisfaction that we hail the formation of group activities within the Manufacturers' Section because you are now afforded a medium through which your much sought for views can be expressed.

A review of the appliance merchandising policies employed by different utilities throughout the United States will show a large variety of plans. Some companies merchandise appliances without any special effort to cooperate with their local dealers, others do not sell gas burning equipment at all and still others merchandise equipment cooperating with their local gas appliance dealers. Frankly, I do not believe that our experience has as yet demonstrated fully which one of these different plans is the logical solution to our merchandising problem. Of this much I am certain, however, that we find the best results being accomplished where the interested agencies are working together harmoniously in the promotion of a common cause. As an example of what can be accomplished where such plans are properly drawn up and applied, I have only to refer to the electrical industry's record of achievement along such lines.

I know very little concerning the actual details connected with the manufacture and sale of gas appliances. I have many friends in this business, however, and I believe that I can profess a degree of familiarity with their problems. If we trace the history of

* Address delivered before Annual Meeting of Manufacturers' Section, American Gas Association, Book-Cadillac Hotel, Detroit, Mich., September 17, 1931.

this branch of our industry back over the past 25 years we cannot help but be impressed by the courageous and tireless efforts that have been put forth by the large majority of such manufacturers. Without exception, they have endeavored to maintain their position against ever increasing competition, which has continually forced the prices which they received for their products lower and lower, and in many instances, below the limits of any economic justification.

Compare that situation with that in the electric industry where the concentration of manufacture in relatively few strong hands has brought about the building up of large reserves which have given the manufacturers capital to prosecute thorough research and to create through their sales efforts the market for their appliances. I feel, however, that the gas industry is at last recognizing that the problem is too big to be dealt with through individual efforts; that it must be handled as a national problem and that they are now ready to subscribe to properly coordinated plans along these lines. If this is conscientiously done, I am firmly convinced that there can be but one outcome; namely, prosperity for the entire industry.

Closer cooperation between utilities and the manufacturers in matters affecting gas service is highly desirable. In some instances there has been a tendency on the part of one party or another to shirk responsibility. Unquestionably it is the manufacturer's duty to provide the customer, through his dealer, with appliances which are first of all safe, and second, durable and efficient. Furthermore, such equipment should come supplied to satisfactorily meet the gas service conditions under which it is intended to operate. Beyond this point the manufacturer's responsibility largely ceases and that of the utility begins. It is clearly the duty of the latter to provide a satisfactory quality of continuous service. Unless this spirit of cooperation does prevail both parties suffer in the end and furthermore the customer is not supplied with the class of service that he expects and is logically entitled to receive.

I am also of the opinion that a great many of our gas company members' practices could be coordinated to a much greater extent to the direct benefit of all concerned. As one example, I feel that much greater cooperation between the manufactured and natural gas industries could be accomplished. A broader exchange of experiences could be brought about to the advantage of both groups.

Within the next few years we may expect numerous attacks from ill-advised politicians, seeking to promote their political aspirations at the expense of our business. In meeting such situations, naturally we must present a united front. I have perfect confidence in the fairness of the American public and I believe that if it is kept properly advised on the situation we have nothing to fear from such attacks providing we continue to follow the policy of maintaining the quality of our service above reproach. I am certain that this must be done and, furthermore, I regard it as being a continuing activity which, in the last analysis, will be the deciding factor in formulating desirable public relations.

I have pointed out only a few ways in which I believe greater coordination of effort could be accomplished. This naturally leads us to the point where we ask how can such conditions be brought about. Without question the American Gas Association represents one of the most effective mediums for such purposes. It seems to me that we have, in the Association's plan of cooperative merchandising and your own Section's plans, two agencies that will go a long ways in solving most of the difficulties I have mentioned. What seems to be most needed now is the general acceptance of these plans and a close adherence to their principles. Referring to some of the details of your own organization plans, I note with pleasure that you have appointed committees among your various groups to eliminate unfair trade practices, to effect a plan of cross-licensing patents, bring about the preparation of more accurate statistical information on gas appliance manufacturing activities and to offer general encouragement to the manufacturers of gas appliances. To me that program spells a new era in the gas appliance business. Your policies, so far as I know them are sound, and mark the initial step in the direction of a genuinely coordinated gas industry. I wish to congratulate all of your members and particularly your officers for the adoption of these most constructive principles and wish you every possible future success.

Captures A. G. A. Scholarship

D. Gordon Holloway

D. GORDON HOLLOWAY has been awarded the 1931-32 American Gas Association Scholarship at Purdue University according to an announcement made by President Edwin C. Elliott. Mr. Holloway has completed the first three years of the chemical engineering course at this University and is specializing in gas engineering. He ranks high in scholarship and personality and has had considerable experience in the gas industry. Mr. Holloway was born on a farm near Geneva, Indiana, and has earned a considerable portion of his expenses while at college.

The Association's Scholarship at Purdue University is one of two, the other being at The Johns Hopkins University, made possible by the income from the Trustees Gas Educational Fund. This fund was turned over to the American Gas Association several years ago with the request that it be devoted to educational purposes.

Gas refrigeration assures a plentiful supply of ice cubes—and a safe place to keep beauty creams and lotions.

Free treatments were given to volunteers in the audience. Frequent references were made to the gas refrigerator as an aid to beauty. The home use of ice cubes and cold packs was featured.

Gas Refrigeration Arrives As Aid To Feminine Charms

THE direct relationship existing between certain phases of automatic gas service and modern beauty methods was demonstrated at a specially arranged "Beauty Care" Show held recently by the Consolidated Gas Company of New York at its midtown office, 212 West 57th Street, New York City.

Leading beauty firms cooperated by supplying experts to demonstrate the latest Parisian and New York beauty methods. A daily feature of the show which was under the direction of the home service department, was the giving of actual beauty and hair treatments to women selected from the audience. Ogilvie Sisters, Helena Rubenstein, Contoure, Marinello, Bliss, and E. Frederics, Inc., were among the nationally famous firms cooperating.

Two automatic gas refrigerators and a basin connected to a hot water supply were used at the Show. Each lecturer spoke of the value of ice as an astringent and used ice cubes from the refrigerators in actual demonstrations. Reference was also made to the necessity of thorough cleanliness and the free use of hot water as a basis of personal beauty.

Another feature of the show was a demonstration of a new "liquid powder" that is poured over an ice cube before use.

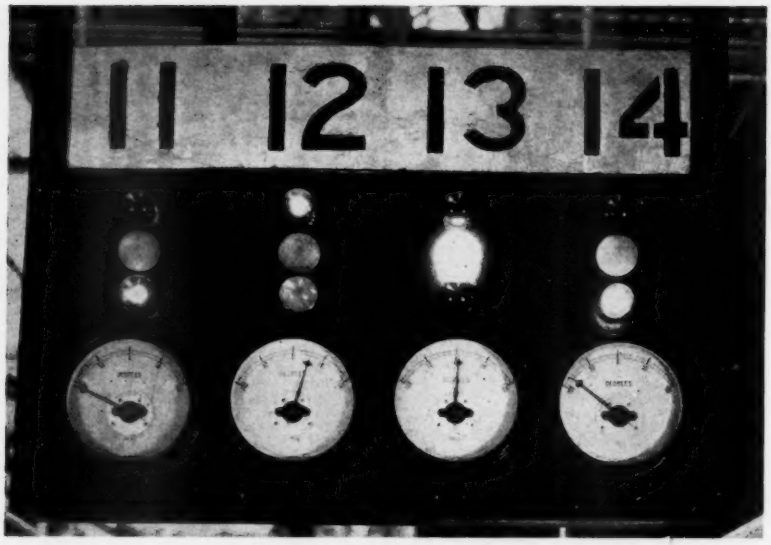
There was a large daily attendance at the show, even on rainy days.

Many interesting incidents occurred during the month. At one of the demonstrations a woman paused to listen for a few minutes, and then started to walk away. A home service girl approached her and gave a cordial invitation to stay.

"I'd like to very much," the woman said, "but I have a steak here and I want to take it right home."

"Why not let me put it in the gas refrigerator on the stage?" the home service girl asked.

The woman was pleased with the suggestion and stayed for the entire demonstration, reclaiming her steak at the end.



Close-up of deviation meters and telltale lights on heat treating equipment at Lincoln Automobile Plant

Lincoln Car Parts Heat Treated with Gas

By J. B. NEALEY,
American Gas Association

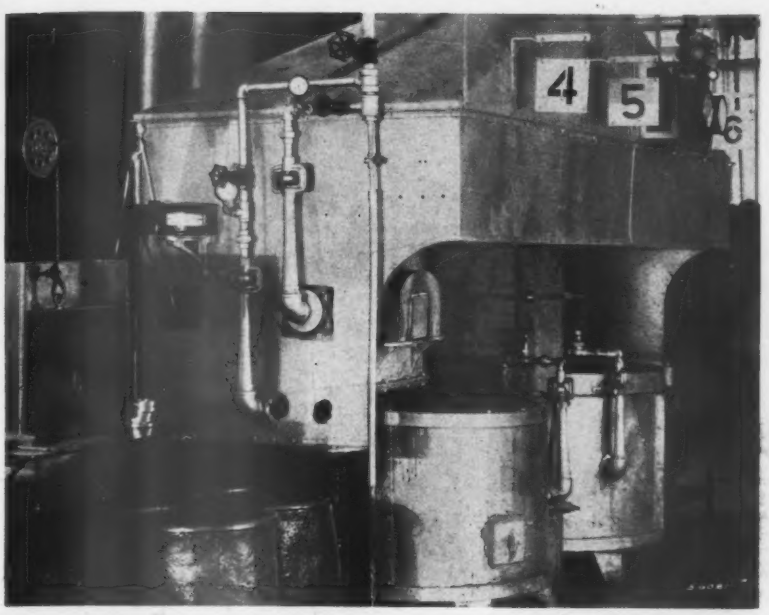
THE beauty and performance of the Lincoln Automobile is reflected in the appearance and efficiency of the plant, at Detroit, Mich., where it is manufactured. The heat treating division has also come in for its share of modernization and stands today as a model department. More than 300 different kinds of Lincoln parts are heat treated here and the fuel used in all of the furnaces, pots, etc., is gas. The equipment is arranged in rows with wide aisles between which provide plenty of room for material handling. One row consists of 8 oven type furnaces, each about 8 ft. long, 6 ft. wide and 4 ft. high, of brick construction and steel encased. They are under fired with a gas burner at each end, the hot products of combustion rising up around the sides of the hearth, behind refractory baffles, into the heating chamber.

The burners are provided with inspirators and any predetermined ratio of gas and air can be obtained and maintained automatically regardless of any variation in the volume of flow of the combustible mixture. Control of temperatures is provided by the use of recording pyrometers and lights. The recorders for all of the heat treating equipment are located in a central control room. These recording pyrometers maintain a constant and accurate record of all heat treating and all batches are identified with this record in such a way that if any part goes wrong it can easily be traced through the heat treatment to ascertain whether the cause lay there or not.

At the furnaces now being described are two panels with four deviation meters on each. These meters have three lights apiece, red, white and green, which are progressively and automatically switched on when the temperature varies 10 degrees either way. Red indicates too hot, green too cool and white the correct heat. Two of this group of furnaces are also provided with automatic temperature controllers including motor operated valves in the gas supply lines. These furnaces are used interchangeably for a number of kinds of heat treatment including carburizing.

All hot work is handled in trays with short legs. The bottoms are made up of spaced pieces of pipe which provides for circulation of air and also tends to prevent warpage of the trays.

Row of gas-fired furnaces in heat treating room, showing operator charging box of parts to be carburized direct from truck into furnace with a dolly at Lincoln Automobile Plant



Gas-fired lead pots showing deviation meters and telltale lights at extreme right and indicating pyrometers at left at Lincoln Automobile Plant

These trays are moved about with high lift trucks and are susceptible of being stacked one above the other. The heated work is withdrawn into trays which are moved along to the quench by means of an overhead monorail.

At one end of this row of furnaces is a packing table where parts are packed into boxes with carburizing compound. They are also unpacked here. The packed boxes are loaded on to wheel trucks of the same height as the table and furnace hearths and rolled direct to the furnaces. Here they are charged into the furnaces with a dolly consisting of two small wheels, several short flat prongs and a long handle.

After carburizing the boxes are removed in the same manner and after cooling transferred to a compound cleaning machine and dumped into wire baskets, the work remaining in the baskets and the compound falling through into a box. This box is raised and the compound dumped into a rotating cylindrical wire screen where the dust and fines are screened out leaving the remainder for re-use.

One of the parts carburized in these furnaces is the cam shaft which is made of S.A.E. 1015 or 1020 steel. This is packed in a box with carburizing compound and is heated in the box to 1730° F., cooled in the box outside of the furnace and then unpacked. It is next reheated in a cyanide pot to 1450° F., quenched in water and drawn at 350° F.

Piston pins are of S.A.E. 2315 steel and are case hardened in carburizing compound. The first heat is 1730° F. and they are cooled in the boxes and then unpacked. They next receive two heatings in cyanide, the first at 1550° F. and the second to 1350° F. and are quenched in oil after both heats. They are drawn for 30 minutes in oil at 350° F.

The cyanide furnaces are of brick with steel shells and are about 5 ft. in diameter and 4 ft. high. They are hooded and hold the pots which are about 2 ft. in diameter and 2 ft. deep. Each is heated with two gas burners set about midway from top to bottom. The waste gases are taken off close to the top by a brick flue and exhausted to the outside of the building. The burners are supplied with inspirators for single valve control of gas-air ratios. The cyanide furnaces are provided with recording pyrometers and deviation meters similar to those previously described.

Close by are steel tanks containing water, oil, and caustic quenches with an overhead monorail serving all. The water and caustic quenches are equipped with air agitation, perforated pipes being located inside the tanks, close to the bottom, through which air is blown under pressure. The oil quenching is agitated by inflowing cooled oil.

The lead pots are located in brick furnaces with steel shells about 3½ ft.

Panel in central control room containing the individual recording pyrometers for the various furnaces, lead pots, etc., in the heat treating department at Lincoln Automobile Plant

Row of gas-fired cyanide pots and quenches at Lincoln Automobile Plant

in diameter and 3 ft. high. The pots are about 16 in. in diameter and 18 in. deep and are fired with a single gas burner to a pot. Small work to be hardened in places only, is treated in these lead pots and fixtures of various shapes and sizes to suit the work, are used. A combination oil and water quench consists of a rectangular steel tank containing water in which sets a steel barrel of oil. Recorders, deviation meters and lights are provided.

Some of the forgings that are heat treated here still retain a little flash and for the removal of this a row of double-headed grinding jacks is provided, all with individual motor drives. The dust is removed by pipes to an overhead header and fan and exhausted to the outside of the building.

An air hammer and gas furnace is used for small miscellaneous forge work, the furnace being of brick enclosed in cast iron plates. It is 4 ft. long, 3 ft. wide and 2 ft. high and has an opening in the top 8 x 10 inches. One gas burner and heating chamber throws heat out through this opening and loose bricks are piled around it to suit the size and shape of whatever object is to be heated.

A complete chemical and physical laboratory is maintained close by where the analyses of raw materials are checked and the physical properties of the finished products ascertained. Experimental and research work is also carried on here.

7,000 Are Enrolled in A. G. A. Course

TOTAL enrollment of public utility employees in the American Gas Association's Employee-Customer Relations Course, on August 17, was slightly under 7,000. This is believed to be the largest number of employees ever enrolled in a single industrial course in the United States.

The course was introduced to the industry in October, 1930, and from the start proved to be a highly successful venture. During the eleven intervening months enrollments have been received at the rate of more than 600 a month. Approximately 150 companies have made the course available to their employees. These include manufactured gas, natural gas and combination gas and electric organizations. About 10 per cent of those enrolled are employed in the central station end of the business.

The course has set up a new high figure for completion records, and cites the experience of two large utility companies in this regard, the Consolidated Gas Electric Light and Power Co., of Baltimore, and the Public Service Electric and Gas Co., of Newark, N. J. Of the 644 employees enrolled from the former company, 98 per cent have completed the course successfully and have received their certificates from the Association. The latter company enrolled 702 of its employees. Of this number, seven left the company and every one of the remaining 695 finished the course and received certificates.

The purpose of the course is to build up in contact employees a higher level of skill in handling customer contacts. Six text books are provided for home study and provision is made for the introduction and use of the group conference method of discussion, wherein employees meet under the supervision of fellow-employees who act as leaders and discuss right and wrong contact procedure out of their own experiences. The majority of those enrolled are meter readers, fitters, shopmen, telephone operators, collectors, cashiers, information clerks and secretaries. A period of six months is required to complete the course.

Beginning this month the Association will enter upon a comprehensive promotion plan to secure enrollments for the fall period. The enrollment will reach 10,000 before next spring, it is expected.

Wins Natural Gas Fellowship

THE American Gas Association Committee on Supply Men's Fund, Natural Gas Department, has selected John A. McCutchin for the Natural Gas Fellowship at the University of Oklahoma. He now is with the Oklahoma Geological Survey, Norman, Oklahoma.

J. A. McCutchin

Mr. McCutchin was born in 1903, graduated from the Beggs, Oklahoma, High School and graduated from the University of Oklahoma in 1928 with a B.S. degree in Geological Engineering.

Research in the Application of Gas Heat to Short-Cycle Malleableizing

By R. SCHNEIDEWIND

R. Schneidewind

WORK has been in progress at the Department of Engineering Research of the University of Michigan for several months to investigate the short-cycles for malleableizing iron. The purpose of this work is to study the effects of the composition of the iron, of the atmosphere of the furnace, and of the temperature upon the rate at which malleabilization can be carried on, and the possibilities of using gas heat in the short cycles. Not all rapidly annealed malleable iron is of good quality. It is expected that the results will show how manufacturers can, through properly controlled heating conditions such as are possible with gas, reduce the annealing time and at the same time obtain a product of higher quality than is now available.

The project is sponsored by the Committee on Industrial Gas Research of the American Gas Association as part of its program of development in industrial gas utilization.

The detailed program of study was decided upon and approved by an Advisory Committee consisting of Herman H. Lind, of the Malleable Iron Research Institute, Enrique Touceda, of the Malleable Iron Research Institute, R. J. Teetor, chairman of the Research Committee of the Malleable Iron Research Institute, Hale A. Clark, of the Detroit City Gas Company, Gosta Vennerholm, of the Ford Motor Company, W. H. Doerfner, of the Saginaw Malleable Iron Company, A. F. Jackson, of the Michigan Malleable Iron Company, T. Mauland, of the International Harvester Company, A. L. Boegehold, of the General Motors Research Laboratories, and Professor Alfred H. White, of the University of Michigan.

White cast iron, as is generally known, contains all of its carbon as combined carbon. Upon heating at comparatively high temperatures from 1500 to 1800° F. a large share of the carbon separates out as graphite, the rest remaining as pearlite. This first stage of graphitization can be completed fairly rapidly. Cooling slowly from 1500° F. to 1200° F. causes the remainder of the carbon, the pearlitic carbon, to graphitize. The microscope shows fully annealed malleable iron to consist entirely of graphite and ferrite.

The accompanying photomicrographs show iron in various stages of malleabilization. The first picture shows the structure of white iron as received; the next shows graphite just beginning to form; the third shows iron at the first stage of equilibrium, that is, when it consists of graphite and pearlite. The next figure shows the pearlite breaking down, each graphite particle being surrounded by a ring of ferrite. The fifth figure shows incompletely annealed malleable iron; traces of carbides can be seen at the grain boundaries. The ductility of such iron is low. The last figure shows the structure of completely annealed iron.

The experimental work was carried on in a downdraft gas-fired furnace provided with automatic temperature control. The gases, that is, the ratio of carbon dioxide to carbon monoxide, in contact with the work were at all times so controlled as to produce a non-scaling atmosphere. In a few special runs, however, oxidizing conditions were purposely maintained.

The results to date indicate that the composition of the iron, and most particularly the silicon content, affects the rate of malleabilization at any given temperature. It has been found, for example, that first-stage graphitization can be completed at 1700° F. in 8 hours if the silicon content is 0.85 per cent, in 4 hours with 1.26 per cent, and in 2 hours with 1.92 per cent silicon. At 1500° F., equilibrium is reached more slowly; with 0.85 per cent silicon it is attained in 50 hours, with 1.26 per cent, in 30 hours, and with 1.92 per cent, in 17 hours. With a fixed amount of silicon, the carbon content affects the rate of malleabilization much in the same manner as the amount of excess reagent affects the speed of a chemical reaction according to its effect on mass action.

In addition to the rate of graphitization, it has been necessary to study the solubility of carbon in iron with graphite as the precipitated constituent at various temperatures. This solubility, as shown in the so-called double iron-carbon diagrams, has not been determined for temperatures below 1500° F. and is not accurate for systems containing silicon in the amounts found in commercial malleable castings. It is felt

Photomicrographs

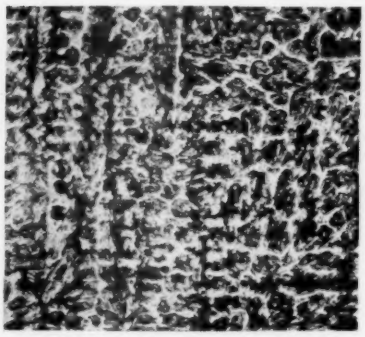


Figure 1

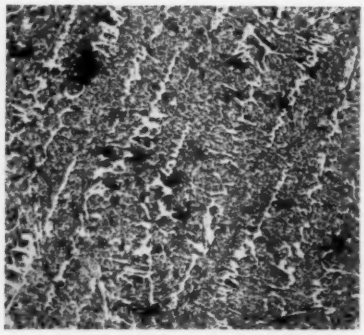


Figure 2

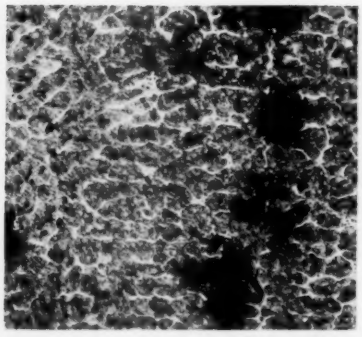


Figure 3

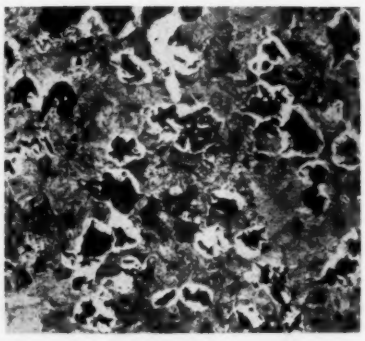


Figure 4

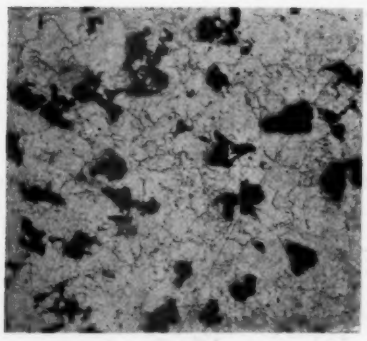


Figure 5

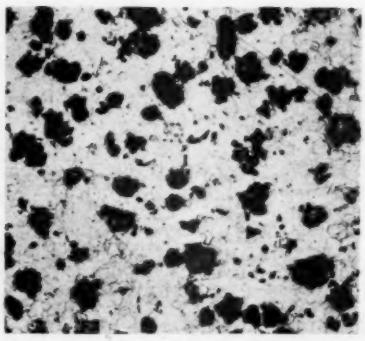


Figure 6

that with a knowledge of the solubility curves and the rates of graphitization, minimum cycles of malleabilization can be predicted with fair accuracy for white irons of any combination of carbon and silicon contents.

The work on the effect of furnace atmosphere completed to date would indicate that, although the oxidizing or reducing nature of the gases does not appreciably change the rate of graphitization, the control of the furnace atmosphere will have considerable commercial value. By maintaining a non-scaling atmosphere the packing material may be eliminated for many types of work. This will effect a saving of approximately 24 hours necessary in bringing the work up to heat and will avoid the unprofitable necessity for heating up large quantities of non-productive material. Additional work is now under way.

Natural Gas Proceedings

for the years 1922, 1924, 1925, 1926, 1927, 1928 1929 and 1930 are available to members at $1.00 per volume postpaid.

Inasmuch as the supply of these volumes is limited, requests for copies will be filled in the order of their receipt.

ADDRESS

AMERICAN GAS ASSOCIATION

420 Lexington Avenue
New York City

Dealer Relations*

Alex. Forward

By ALEXANDER FORWARD,
Managing Director, American Gas Association

DEALER relations is one of the most important subjects to the gas industry. It has several sides and many angles and no single pronouncement on this subject will meet with unanimous approval no matter what it may be.

It is my belief, however, that when all the factors are weighed it will be found there are no insurmountable barriers to general accord and we have good reason to hope that we are approaching this goal, not only nationally but locally.

For at least a decade efforts have been made not only through local policies of gas companies and dealers, but also nationally, to bring about a clearer understanding of the mutual problems of the utility and the dealer in appliances. In earlier years these efforts were more or less tentative although we may reasonably believe that some tangible results were achieved. In 1926 I had the pleasure of addressing at Evansville, Indiana, the Conference of Presidents and Secretaries of the Master Plumbers and Heating Contractors Associations, the merchandising organization of the National Association of Master Plumbers. I there expressed the opinion that gas companies generally were willing to work with plumber-merchant in a friendly cooperative way. From the floor several people wanted to know about conditions in their localities and I brought back with me a substantial number of notes involving local situations.

Out of this came the creation of a joint committee between the American Gas Association and the National Association of Master Plumbers, which held several meetings at Association Headquarters. The net result of these confabs was an agreement that the problem was mainly local. At our own instance, letters were addressed to the local gas companies suggesting that they make the approach to the local plumber-dealers and endeavor to reach understanding by talking matters over. The idea was followed by the dealers in several states, including the Illinois Master Plumbers Association.

Some reports as to the results of these conferences were received, but not many.

When our Blue Star Home campaign developed, largely as a result of our Testing Laboratory operation, our field man was especially charged with the duty of being of any possible assistance in bringing the local utility and the local merchants and plumbers into touch with each other. He did so on numerous occasions and throughout the years from 1927 to 1930 our records show joint meetings and conferences in many localities where these matters were talked over and in not a few instances forces were combined to help popularize the Blue Star all-gas home.

The agreement reached in writing between the American Gas Association and the Heating and Piping Contractors Association August 1, 1929, setting forth merchandising principles is further demonstration of the efforts put forth in years past.

It is not difficult to trace the causes of the agitation which arose in the year 1930. Mainly it was economic. When business is not good it is human nature to seize upon anything in sight as an object of blame. Most of the agitations of our time, including complaints of trade practices, investigations, demands for legislation, are due to the unfavorable economic situation.

But this was not the only cause. In some localities gas companies, fully mindful of the enormous promotional efforts and merchandising expense which they had to put forth to build up their business, without substantial help from the dealers, had failed to realize that their hard work and its successful results had so stimulated customer acceptance of the principal gas burning appliances as to create an easy and quite legitimate market for the hardware dealer, the furniture dealer, the department store and the master plumber. This delay in recognition of the situation which the gas companies, through their excellent commercial activities had themselves created, engendered a feeling among their competitors in the sale of appliances that they were unable to compete upon the same terms with the utility, which was sometimes true.

When a feeling of this sort develops it is not very long before someone comes along to capitalize it. It is easy to blame the demagogue or the racketeer, but sometimes the people who unwisely employ him and his efforts have a grievance. That grievance must be recognized and dealt with.

Feeling in a number of states was capitalized in the early months of the present year through the introduction in legislatures of eleven states of bills designed to make it illegal for public service corporations to sell merchandise. These states were California, Illinois, Indiana, Kansas, Missouri, Nebraska, Nevada, Oklahoma, Pennsylvania, Tennessee and Texas. In two, Kansas and Oklahoma, the bills were passed and signed by the respective governors and have now gone into effect.

Only a few state legislatures will meet during the coming winter. In these we may see renewed efforts for legislation of this sort. In the other states the renewal of demand at the sessions of 1933 may depend partly upon the economic situation and partly upon the result of sincere, whole-hearted, cooperative efforts on the part of all the national organizations of all trades and industries concerned to work out this problem.

Nearly three years have passed since Colonel Fogg, past president of the American Gas Association, called attention to the magnitude of this problem in a speech to the New

*Address delivered at Annual Meeting of the Empire State Gas & Electric Association, Lake George, N. Y., Sept. 10, 1931.

England Gas Association in which he said:

"So long as there remains any tendency to restrict appliance sales to the limited scope of the gas company's organization, however efficient that may be, just that long will our domestic business remain in jeopardy."

A survey of the dealer situation made by Floyd Parsons in the summer of 1930 revealed some interesting facts which were summarized by him in a series of articles in his usual attractive and comprehensive style.

Addressing the last annual convention of the American Gas Association, Clifford E. Paige, then our president-elect, made an address which expressed the situation in such masterly fashion as to command the attention of the industry.

"The gas industry on its own motion," said Mr. Paige, "never entered the appliance business. It was thrown into this business as a necessity for survival. . . . A gas company undertaking to do business in a community accepts a definite responsibility. It agrees tacitly that it must do all in its power to build up the community. . . . One of its obligations is the development of its business. Its measure of growth is to a large extent its measure of prosperity; its measure of prosperity influences greatly its ability to furnish service; its service determines its sales and the greater the sales the lower the rate which the consumer enjoys."

After reviewing the criticisms which had up to that time arisen among our competitors, Mr. Paige summed up in this manner:

"It is not a situation which can be met by hostility or by evasion. Much of the situation may be due to entirely local misunderstandings. The whole matter is a challenge to the utility industry. We must meet it,—perhaps locally and perhaps nationally. . . . We must urge upon each company member and each individual member of this Association the necessity for seeing that he makes no contribution to misunderstanding or doubt with respect to our attitude. Our business and our practices have been on too high a plane to require defense, but we should look upon this as an opportunity through which, by fair dealing, we advance the interests of the community, the dealers and ourselves."

President Mullaney at the same Convention commented most pertinently as follows:

"In most cases the gas company has created and is maintaining the market for these appliances and to all appearances we can never abandon this position of leadership, at least not for many years. Yet sympathetic understanding with dealers, many of whom are, or are becoming, real merchants, is being promoted in what is perhaps a major portion of the industry. . . . While it is true that the gas companies have done most of the work in creating a demand for gas appliances, we should not deny ourselves a selling service through sales allies, which may at some points and under some circumstances be as good as our own, if not better."

Following a survey conducted by the Committee on Dealer Relations of our Commercial Section, at the request of our Committee on Allied Trades, a set of working principles was evolved by the Allied Trades Committee with Colonel Fogg as chairman. These principles after full discussion and many conferences were adopted by the Executive Board of the American Gas Association at its meeting in Atlantic City on May 2. Subsequently they have been adopted by the National Association of Master Plumbers and the National Retail Hardware Association, and unreservedly recommended to their membership.

About six weeks later a set of principles mainly modeled after our own were adopted by the National Electric Light Association.

Representatives of the national organizations of dealers and master plumbers have participated in our conferences and have asserted freely that they believe in cooperation and not in legislation and have contributed substantially to working out of mutually agreeable principles. Their sincerity and their helpfulness is most evident.

I make no apology for here reading these principles although without a doubt every one of you has read them.

"It is recommended that Gas Companies take the initiative in bringing about conferences with dealers in their localities, to the end that the following or other Mutually Acceptable Principles may be agreed upon, adopted and put into use for the purpose of stimulating the sale of suitable gas appliances and promoting the use of gas service in a way that will be mutually advantageous to all participants."

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1. All gas appliances offered for sale by all cooperating agencies shall bear the seal of approval of the American Gas Association Testing Laboratory.
2. No appliances or merchandise not directly related to the use of gas shall be sold by gas utilities.
3. In all merchandising activities, the resale mark-up of all gas appliances that have received reasonable customer acceptance shall be consistent with present day merchandising practices. There shall be no premiums given with nor trade-in allowances made in connection with the sale of any such appliances unless all cooperating agencies are in a position to participate.
4. The presenting to the public of those gas appliances not having received reasonable customer acceptance shall be considered as promotional activities and not as merchandising activities.
5. Coordinated advertising of approved appliances should be developed by gas utility companies and local dealers, and the gas company should give all reasonable assistance possible to the dealer in advertising displays and sales assistance.
6. The deferred payment feature of our merchandising activities shall be on an economically sound basis.

These principles have been generally published and were circulated to the members of the Association. We are in receipt of a number of responses expressing cordial approval and cooperation and in some instances making practical and pertinent suggestions. Manufacturers of appliances have gone whole-heartedly into the movement and some manufacturers have taken the initiative in suggesting methods by which they can work with local utilities and with local dealers and plumbers for the solution of this problem.

One state utility association has passed a resolution approving the merchandising principles of the American Gas Association and the National Electric Light Association and recommending that member companies promptly review their merchandising policies now in force and bring them in line with these principles. I shall read a second resolution of this state association:

WHEREAS: After a careful review of statements of facts gathered from many points in the State of ————, it is ap-

parent that there exists a small but active group committed to the policy of passing legislation to force the utilities to cease the merchandising of gas and electrical appliances, and that this group is actively soliciting the backing of merchants for this program.

BE IT RESOLVED: That the weight of evidence clearly shows that where the utility promotes and sells gas and electric consuming appliances with due regard to sound merchandising principles and trade ethics, the best interests of the public, the merchants, and the utilities are served, and on these premises the Merchandising Committee of the Association recommends that member companies promptly make contact with merchants in the territory served by them: lay frankly before them the facts as they are known; the policies they pursue; and thus inform the merchants and public at large of the menace of such legislation, for the public good.

AND: That the merchants be offered by the utilities a full measure of sound cooperation in the merchandising field, to the end that a full and harmonious merchandising job may be done to the best interest of all concerned.

This resolution boiled down means the organization and handling of group meetings throughout the state, at which the utilities will frankly inform interested merchants and plumbers why the public service companies originally entered the merchandising field and what they have accomplished in that field; what their merchandising policies are and the full measure of cooperation locally offered to interested merchants, with a view to rounding out localized merchandise cooperative plans.

We can probably visualize what will happen at such a meeting as affecting the first part of this program. The utilities, as everybody knows, originally entered the merchandising field and are in it now to stimulate the sales of their products. If, when gas ranges were developed, the gas companies had relied upon merchants to create the market, hardly anybody would be cooking with gas today. In order to sell the idea of gas cooking to the people, the gas companies sometimes gave away ranges and sometimes rented them. They advertised extensively, employed salesmen and spent considerable amounts of money in promotion. The result is that they built up a demand for gas ranges. The customer acceptance having been achieved, it was not only natural but legitimate that department stores, hardware stores, retail furniture stores, should enter the field and claim a portion of this business. The same is true to lesser extent of other gas burning domestic appliances, with the exception of gas refrigerators, which are so new in the field that gas companies are today doing nearly all of the promotional work.

I may ask parenthetically, where would gas refrigeration be today if it had to depend upon the initial effort of the dealers? The dealer is not usually equipped for promotional efforts in regard to a single line of business. Usually he lacks exhibition space and even in a large department store it generally constitutes but a single item of floor space. On the other hand, it is the very existence of the gas company which usually has the equipment for proper display. The dealer will not spend the money for advertising the gas range that the gas company will spend, for the same reason—it is a mere item in the large program of the department store. Where is the dealer who will organize forces of salesmen, put on selling campaigns and employ women demonstrators to sell gas burning appliances?

For progressive merchandising policies the gas company must in most localities continue in the field of appliance merchandising or it cannot effectively serve the community in which it does business.

In the net this means that the gas company will, when an appliance has received a reasonable degree of customer acceptance modify its merchandising policies so as to permit dealer competition on fair terms. The dealers are entitled to participation in this field. They cannot and should not be kept out of it and furthermore any effort to keep them out means, as Mr. Mullaney said, denying ourselves the sales efforts of people who may know as much about merchandising as we, if not more.

In your state dealer relations are mostly excellent. There are outstanding examples of most successful cooperation in your territory, the outline of which would consume an entire speech. As a very recent instance of what may be done by thoughtful and intelligent cooperation, the Niagara Hudson Power Company in your state has prepared and has issued to the appliance merchants in its field advance announcements of its merchandising platforms and its advertising copy, and suggestions as to its merchandising platform. Somebody has said that as nothing succeeds like success, so nothing cooperates like cooperation, and it is in such a spirit as that manifested by the Niagara Hudson Power Company that we shall eventually work out these problems.

I quote briefly from an excellent address by Hugh Cuthrell, chairman of our Commercial Section's Committee on Dealer Relations in presenting our statement of principles to the National Retail Hardware Association and the National Association of Master Plumbers:

"As with all progressive movements, the idea seems to take root more firmly in some sections of the country than in others. The same is true with individuals. Some can immediately see the value of the movement such as this, while others must be shown. Before the goal we have set for ourselves shall have been finally reached, we will probably meet with disappointments and some may become discouraged, but the plan must ultimately succeed, not because of its adoption by my association or its acceptance by yours but because it is economically sound and essentially fair, and more important, it is necessary to the proper fulfillment of the proposition to which both associations are committed, namely, service to the public."

I quote with pleasure from an address by Conrad N. Lauer, President of the Philadelphia Gas Works Company at the Annual Convention of the Pennsylvania Gas Association in April last.

After commenting that "gas company merchandising is necessary to assure the sale of quality merchandise and the continued improvement in equipment," and that "the dealer, more interested in his per cent of profit, is not so likely to look ahead and predetermine the value of reliability of service in long continued operation of an appliance," he called attention to a most important factor in this situation: Mr. Lauer said, "The gas industry is insistent on such vital factors as safety, durability and efficiency and, as evidence of

this, the work of the Testing Laboratory of the American Gas Association is outstanding."

In other words, as we all know, so great is the gas industry's responsibility for reliability and safety of gas burning appliances that our Laboratory Approval Seal is now accepted everywhere. People do not care to buy an appliance that does not carry that seal. Could anything be more eloquent of our responsibility to the public and of our recognition of that responsibility?

Not only does the gas company need the dealer but the dealer is in absolute need of the gas company's support and vigorous merchandising policies. In a certain court record there appears an affidavit from a utility company giving its experiences after it had suspended the sale of appliances. In response to the demands of local dealers this utility discontinued merchandising and left the field to the dealers. The result was that during the next twelve months the sales of appliances by dealers dropped one-half. This was clearly because the selling force and drive of the utility was no longer behind the dealer and no longer behind customer acceptance of appliances.

In another city, where a municipally owned utility competes with a privately owned utility, the dealers were able to exert such political pressure as to bring about the discontinuance of merchandising by the company. Within less than six months the dealers were back requesting the company to resume merchandising. The lack of utility activity hurt their business.

Certain things should be noted regarding the principles of cooperation.

1. They are general in scope and will need adaptation to local conditions.

2. No statement of principles in a matter of this sort can be regarded as a matter of final expression of the American Gas Association, and I am sure the dealer and plumber organizations are also quite willing to review the principles from time to time as conditions may change so as to have them always applicable to the existing situation.

3. The third and most important lies in following the initial recommendation that gas companies take the initiative in bringing about conferences with dealers in their localities to the end that these or other mutually acceptable principles be jointly agreed upon. Our surveys and data show many localities in which dealer antagonism exists despite the fact that the gas company's present merchandising policies and practices are not prejudicial to the dealer interest in any important degree. Conferences with dealers at which these policies are fully explained are just as essential in such cases as in those where new policies are under discussion.

4. The adoption of principles even when fortified by friendly cooperative conferences with dealers will not be sufficient if the machinery is left to run by itself. A situation apparently in perfect health today may be subject next month to the unrecognized infection of misunderstanding, leading to trouble unless corrected.

Selling is a day to day job and the principles adopted can only be effective if they are made a controlling factor in operations by gas companies and manufacturers, with the full and continued support of those in control locally.

This is a continuous duty for everybody, and for American Gas Association Headquarters as well as for member companies. It will never be finished.

5. While perhaps not specifically dealt with in the statement of principles, it is there implied that utility companies have a duty to each other. This duty may be discharged not alone in the exchange of information through Association channels. Just one or two local situations in a state may result in attempted unwise legislative dealing with an economic issue, affecting all other companies in the same jurisdiction, and indeed throughout the whole country.

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Use of Hydrocarbon Gases For Bright Annealing of Metals*

By E. G. DeCORIOLIS and R. J. COWAN

THE general problem of the corrosion of material and in particular the corrosion of metals has received great attention owing to its obvious economic importance. Attention for the most part, however, has been focussed on the corrosion of metals under atmospheric conditions. Relatively little thought has been devoted to the corresponding corrosion problem which occurs during almost all high temperature operations involved in the preparation of metals for industrial purposes. Typical of such operations are those of annealing, normalizing, forging, etc. Under the conditions of these processes, corrosion or oxidation proceeds far more rapidly than atmospheric corrosion and is of no less economic importance. In this paper, the authors are concerned with one aspect of the general problem,—with the prevention of oxidation of metals during the process of annealing.

The problem of the bright annealing of metals is essentially a chemical one. It is perhaps owing to the fact that combustion and heating operations have in the past been considered the province of the power engineer or the mechanical engineer that certain of the more involved chemical problems attendant upon, or arising out of industrial heating operations have not received the attention that their economic importance merits. It is, of course, well known that metals vary greatly in the ease with which they will combine with oxygen at high temperatures. Silver, for example, may readily be heated at high temperatures in an atmosphere that would rapidly oxidize iron, without the occurrence of any appreciable amount of oxidation. To the chemist, the more precise statement of these observations is that the free energy of formation of the oxides decreases as we descend the electromotive series of the metals. For these reasons we find that some metals may be maintained bright very easily during heat treatment, the only requirement being that no free oxygen shall be present in the atmosphere. This is generally accomplished by using raw gas or the products of combustion in a muffle furnace. In some cases steam is employed and this generally has proved moderately satisfactory for the bright annealing of copper.

In a previous paper presented by the authors before this Society[1] a general survey was given of the reactions occurring between metal surfaces and the gases available industrially for high temperature furnace operations. The difficulty of heat-treating copper zinc alloys, usually included in the generic term "brass" was emphasized. At low temperatures the difficulties encountered are not great but as the temperature is increased to desired annealing temperatures and where zinc begins to volatilize from the surface the difficulties are multiplied. The volatilization of zinc seems to be coincident with the liberation of occluded gases. These gases are oxidizing to the metal and result in the formation of a scale on the surface of the metal consisting either of zinc oxide or a mixture of oxides. Thus the metal becomes tarnished and the problem of bright annealing is greatly complicated.

The usual method of approach to this problem has been to employ various atmospheres that are commonly considered neutral or reducing in their action. In gas-fired furnace technique the attempt has been made to use a purified flue gas. To do this, it has been necessary to remove the water vapor and carbon dioxide since both of these are highly oxidizing to heated brass. This leaves a nitrogen atmosphere containing small amounts of carbon monoxide. Such attempts have not succeeded in producing a bright annealed brass owing primarily to the oxidizing gases liberated from the metal itself. In a recent contribution on this subject[2] the authors have presented experimental evidence to show that neither pure nitrogen nor in fact pure carbon monoxide will prevent the staining and scaling of brass during the annealing process. In the paper referred to, the authors were also able to prove experimentally the fact that relatively small amounts of methanol vapor added to atmospheres that were highly oxidizing to brass would, however, completely prevent the formation of oxide films on the metal surface. The phenomena observed could all be accounted for on the assumption that the methanol vapor was acting as an inhibitor to the oxidation reactions. The mechanism of this inhibitory action was not determined but it is not improbable that it was brought about by the selective adsorption of the methanol vapor on the metal surface.

In continuing the experimental investigation of these phenomena it has been found that under proper conditions the bright annealing of metals and particularly of brasses can be accomplished in an atmosphere of hydrocarbon gases. The underlying phenomena which make this bright annealing process possible are apparently not limited to hydrocarbon gases but may be obtained by employing any gas which will liberate hydrogen or in fact hydrogen itself under properly controlled conditions.

The experimental investigation may be most briefly presented by describing the actual method of procedure.

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* Presented before the American Chemical Society, at its annual Convention, last month, in Toledo, on behalf of the American Gas Association Committee on Industrial Gas Research.

[1] Effect of Atmospheres on the Heat Treatment of Metals. E. G. deCoriolis and R. J. Cowan. Ind. & Eng. Chem. Vol. 21, p. 1164, Dec., 1929.

[2] The Chemical Effect of Gaseous Atmospheres in the Bright Annealing of Metals. R. J. Cowan, Joint Production & Chemical Conference, American Gas Association, Philadelphia, Pa., May 20, 1931.

Fig. 1 shows the laboratory apparatus that was employed for most of the experiments. Brass wire of 18 gage was threaded through a laboratory tube furnace on a reeling device that made it possible to control the rate of travel through the hot zone. Hydrocarbon gases were introduced along the furnace tubes at particular points and made to flow in the desired direction by controlling the pressure at various points in the tube. The flow of gas, the temperature of the furnace and the speed of travel of the metal wire were controlled by the usual methods. The wire employed was initially constant throughout as to composition, hardness and grain structure.

The hydrocarbon gases employed were methane (natural gas), ethane, propane, butane, ethylene and acetylene. All of these gases behaved substantially alike so far as the results pertinent to this investigation are concerned. Analyses of the gases issuing from the furnace were made where the information was necessary for the interpretation of results. In such cases, a standard U. S. Steel gas analysis apparatus was employed.

The initial series of experiments indicated that unless the furnace was heated to a temperature equal to or in excess of 1250° F., the brass wire could not be made bright even in the hot zone itself. Perhaps it should be mentioned that the wire could be satisfactorily annealed at lower temperatures but in such cases the surface was always found to be badly oxidized or coated. It was also found that when the hydrocarbon gas was fed into the furnace counter-current to the movement of the metal, the surface of the metal was always oxidized even though observation showed that it had been rendered bright in the hot zone maintained about 1250° F. This fact threatened to prove an obstacle to the practical operation of the process, since if the gas were made to flow counter-current to the work, the latter would tarnish as it advanced to meet the inflowing gas. On the other hand, if the gas were made to flow concurrent with the metal, air would be drawn in along with the metal giving rise to the probability of tarnishing the surface as it cooled in the products of reaction.

However, as the temperature to which the hydrocarbon was exposed before coming into contact with the metal was raised, it was found that if the gas was exposed to a temperature about 1250° F. before contacting with the metal, no tarnishing occurred. At this temperature, a pronounced cracking of the gas had occurred, resulting in the precipitation of a small amount of carbon and the production of hydrogen. The amount of this cracking, of course, was a function of the hydrocarbon employed and the catalytic effect of the tube walls. It was observed further that unless this cracking occurred, a bright anneal could not be obtained. For example, a glass muffle had so little catalytic effect on the decomposition of methane that in this case no observable cracking occurred at 1250° under the conditions of the experiment. Under this condition it was found that the surface of the brass could not be rendered bright until a temperature of 1450° F. was employed at which temperature an appreciable amount of cracking occurred. In the case of acetylene on the other hand, cracking occurred at temperatures appreciably lower than 1250° yet it was found necessary to subject the gas to this temperature before the surface of the brass could be maintained bright.

These results appeared to indicate that in order to obtain a bright surface at a temperature equal to or above the desired annealing temperature of the brass, it was necessary to accomplish two things. Some cracking of the hydrocarbon must have taken place and the gas itself must have been exposed to a temperature of at least 1250° F. When the gas was in such condition as to avoid tarnishing the metal, it was then in a condition to bright anneal properly. What is termed here the "bright annealing reaction" has distinctive and characteristic effect. It is very definitely a reaction on the metal surface whereby the metal becomes brilliant in luster and superior in appearance to its original condition. When hydrocarbon gases are employed, this reaction is only accomplished when the two criteria just mentioned have been met.

In order to determine more precisely the mechanism of the bright annealing reaction the attempt was made to determine whether the phenomena observed were due to a transient intermediate compound formed during the decomposition of the hydrocarbon or due to the formation of hydrogen alone. The results already described seem clearly to indicate that the hydrocarbon itself was not responsible for the bright annealing reaction. Accordingly a series of experiments were conducted using pure hydrogen alone in place of the hydrocarbon gas.

Confirming results previously reported by us, it was found that pure hydrogen does not produce a bright anneal at the usual brass annealing temperature (1000° F.). If a piece of brass be heated in such an atmosphere and observed during the heating, it will be seen to tarnish at temperatures around 800° F. There is no indication of bright annealing, short of 1200° F. At this point, however, the reaction proceeds rapidly and a beautiful metal surface is produced. Below this point the gas seems to be inert. This temperature, therefore, must be either the temperature at which the reaction system must be raised in order to obtain a sufficiently rapid reduction of oxides or else it must be the temperature at which hydrogen must be brought to activate it so that the reduction of oxides may proceed.

Now it is of some importance to be able to bright anneal brass without raising the temperature of the metal itself to 1250° or above. In many cases, to do so would result in an over-annealed condition with a consequent grain growth that would be objectionable for some industrial purposes. That the temperature of 1250° F. was not the minimum temperature which the metal itself must obtain in order that deoxidation might proceed was proved by the following results. When brass is heated to a definite temperature its structure reveals a definite grain size corresponding to this temperature. By this means, it was found possible to approximate very closely the temperature which the brass had at-

tained on being passed continuously through the heated muffle. A simple comparison of the grain size of the sample with the grain size of similar samples subjected to known temperatures suffices to accomplish this. Using this method it was found that brass could be bright annealed at lower temperatures (800-900° F.) in pure hydrogen if the hydrogen itself were heated to 1250° F. or above. These temperatures were obtained by passing the metal through the hot zone at such a rate that it could only reach the desired metal temperature. If the temperature of the hot zone, that is the temperature of the hydrogen were less than 1250° the reaction did not take place. The point to be emphasized clearly is that apparently the metal oxides could be reduced readily at temperatures below 1000° F. if the hydrogen itself was at a temperature in excess of 1250° F. and that reduction apparently did not occur if the hydrogen temperature was below 1250° F.

These results seem to contain considerable evidence that the bright annealing reactions were brought about by hydrogen in some particular condition or state of activation. Further evidence of this fact was obtained when ammonia was substituted for hydrogen. The results were quite similar to those obtained with hydrocarbon gases. The ammonia dissociates somewhat more readily in the iron tubes employed than do the hydrocarbons. Nevertheless it was found that not only must dissociation have taken place with the consequent liberation of hydrogen but that the products of dissociation must have attained a temperature of approximately 1250° F. for the deoxidation of the metal surface. Under these conditions, however, a very satisfactory bright anneal can be obtained.

Certain recent work by other investigators may have a bearing on this problem.[3] H. S. Taylor and his associates have found that the adsorption of hydrogen on metal surfaces does not follow a simple law but presents certain complexities. At fairly definite temperatures which apparently vary with the condition of the metal surface the amount of hydrogen adsorbed by the metal increases in a sudden and striking way. One explanation given is that at the critical temperature some change has taken place in the hydrogen which enables it to pack more closely on the metal surface. To be sure, the observations made by Taylor et al. were at temperatures very much lower than those with which we have dealt. This difference may possibly be explained by the different character of the metal surfaces employed in each case.

As a result of this investigation a process for the bright annealing of metals has been developed which is applicable to industry. Apparently any gas which is not deleterious to the metal and which will serve as a source of hydrogen may be employed. Pure hydrogen itself may be used, but it has certain severe limitations. Not only is its explosibility a drawback but its use increases the volatility of zinc when the metal being annealed is brass. Comparative tests indicated that there was a loss of 1.8 per cent of the weight of brass sheets when annealed in a hydrogen atmosphere as compared to a loss of .72 per cent under similar conditions when the annealing atmosphere was methanol and flue gases.

Apparently hydrocarbon gases will prove the cheapest and most available raw material for this bright annealing process. With their use it is possible to produce the desired amount of hydrogen under suitably controlled conditions. The ready availability and ease of handling of these gases renders them particularly attractive for commercial operation.

The details and the practical operation of this process have been worked out and it has been adapted to the bright annealing of many different metals and alloys. The metal is passed through a tube furnace in the form of wire or strip. Seals are provided at each end of the furnace and the hydrocarbon gas is admitted through inlets suitably situated in the tube or muffle. The degree of anneal is determined by the rate at which the metal is moved through the tube. The temperature of the hot zone is maintained slightly above 1250° F. Since brass is the most difficult of the industrial alloys usually encountered to bright anneal, the industrial development of this process has been approached with the peculiar requirements of brass in view. It has been found, however, that all other metals and alloys investigated respond in much the same way to the bright annealing process. The details of operation vary with each metal but the essentials of the reactions are the same. Figure II illustrates a type of furnace which has been developed for the practical operation of this process. Steps are now being taken to commercialize its applications.

This research was undertaken on behalf of the Committee on Industrial Gas Research of the American Gas Association and was conducted in the laboratories of the Surface Combustion Corporation by its staff in collaboration with Dr. S. P. Burke, the Company's Consultant.

[3] Gauger and Taylor. Journal Am. Chem. Soc. Vol. 45, p. 920 (1923). Taylor, J. Phys. Chem. Vol. 28, p. 897 (1924). Taylor, J. Proc. Roy. Soc. (London) A 113, p. 77 (1926). Benton and White. Jour. Am. Chem. Soc. Vol. 52, p. 2325 (1930).

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A. G. A. Sends Message To Pacific Coast*

By ALEXANDER B. MACBETH,
Former President, American Gas Association

I AM commissioned by Clifford Paige, president of the American Gas Association, to extend to the Pacific Coast Gas Association his greetings and best wishes, and to express his regrets and disappointment that he is unable to be here in person. Both he and Mr. Forward, the Managing Director, are engaged this week with an executive committee planning the activities of the national Association for the ensuing year; and I think we can agree that they could not be doing anything at this time of any greater importance and significance to the gas industry.

We recall that Mr. Forward came out to Pasadena last year by air, but not even that method of transportation permits his presence at this time.

Five years ago, the American Gas Association undertook something unique in American industry, and it is pretty nearly unique today. A committee was formed of the foremost men of the industry who surveyed the entire field and brought in a report outlining a plan for Association activities for the ensuing five years. That report, prepared by the committee headed by the Honorable George B. Cortelyou, has been the basis of all subsequent Association undertakings and it is the yardstick by which all proposals for activities are measured. It has so completely stood the test of time that when the five years were about to expire and the Executive Board appointed another committee to write a plan for a like period, the Committee of 1931 reaffirmed the basic principles for the industry's progress and for the Association's program, written out so carefully and thoroughly in 1926.

At the Executive Conference in Atlantic City, May 1 and 2 of this year, I had the pleasure and privilege of hearing this plan discussed and of voting for the adoption of this committee report. It has been published in the American Gas Association Monthly and in the trade press—and every gas man and gas woman should read it. The very fact that the gas industry, through its national Association, proceeds with an orderly program, especially in the light of changing conditions, and backed by a united industry, is sufficient assurance that we intend to maintain and advance our position as an essentially basic American industry.

I am further requested by President Paige to extend his felicitations upon the establishment on the Pacific Coast of a branch of the American Gas Association Appliance Testing Laboratory. He says it was due to our initiative that the Executive Board readily assented to this expansion of its activities when presented by Chairman Gallagher of the Laboratory Managing Committee; and it is backed by the same resolute purpose that has brought the parent Laboratory at Cleveland into the vanguard of those national industries which are policing themselves in the interest and for the protection of their customers.

The Los Angeles Laboratory has made an auspicious beginning. It is establishing itself in the confidence of the industry and, as Mr. Paige says, it needs only the loyal cooperation and support of the gas companies and manufacturer companies on the Pacific Coast to make it a great stabilizer and a great incentive to the successful advance of the gas business in our section.

There are many problems in our time and there are a number of problems which are outstanding; and all of them are more or less affected by business quiet. The extension of natural gas seems to be somewhere near the point of economic stabilization, so that perhaps in the near future we may know pretty well where we are going and how far we can get in this field. Gas mixtures, where their use is the most efficient and economical, create new problems. The American Gas Association Laboratory has accomplished a very large amount of research for the industry in this respect. The Association is continuing its program of research in industrial gas utilization.

The Association has, in the past few years, done notable work in developing and executing courses in domestic gas salesmanship, in industrial gas salesmanship, studies in sales management, and has more recently launched, with immense success, the course in employee-customer relations. This latter course has reached thousands of enrollments throughout the country and a number of gas companies have said it is perhaps the most valuable thing the Association has done for its members in recent years.

Finally, Mr. Paige, realizing that distance prevents such close contact as may be readily maintained in the East, invites suggestions and welcomes opportunities for service by the American Gas Association to the fraternity on the Pacific Coast.

*Delivered before Annual Meeting of the Pacific Coast Gas Association at San Francisco, Calif., August 31, 1931.

Defer Franchise Vote in Oklahoma City

UPON request of the Oklahoma Natural Gas Corporation, the date for the election on the new proposed franchise of that company in Oklahoma City has been postponed from September 22 to October 27 by unanimous vote of the City Council.

By an amendment to the proposed franchise offered by the company and approved by the council, the city is privileged to buy the Oklahoma City property of the company at the time and under the terms provided for in the franchise now in effect, which does not expire for about three years.

Speakers Invited To International Coal Meeting

A TENTATIVE list of speakers and subjects for the Third International Conference on Bituminous Coal to be held at the Carnegie Institute of Technology, Pittsburgh, November 16 to 21, has been announced by Dr. Thomas S. Baker, organizer of the meetings and president of the institution sponsoring it.

The preliminary program contains the names of almost 100 speakers who will contribute to the world meeting. The papers have been classified into 12 major sections.

Seventeen countries will be represented in the conference, and an attendance of well over 2,000 persons is expected. The desperate plight of the coal industry has added impetus to the meeting, and the organizers feel that the conference comes at an appropriate time.

The tentative program, divided according to sections, follows:

CLEANING AND PREPARATION—C. Berthelot, France—Methods of Coal Washing with Particular Reference to Fine Coal. Byron M. Bird, United States—Interpretation of Float-and-Sink Data. Dr. I. L. Blum, Roumania—The Role of Humanic Acids in the Briquetting of Brown Coal. Prof. W. R. Chapman, England—Coal Cleaning Practice in Great Britain. Thomas Fraser, United States—The Air-Sand Process of Coal Cleaning. Prof. Dr. Karl S. Glinz, Germany—Impact Mills for the Manufacture of Powdered Coal. Prof. Dr. B. Granigg, Austria—Laboratory Experiments on Magnetic Coal Dressing. Prof. Dr. Hans G. Grimm, Germany—Recent Progress in the Refinement of Coal. Dr. Karl Lehmann, Germany—Preparation of Coal from a Petrographic Point of View. E. B. Ricketts, United States—Value of Clean Coal for Steam Production.

HYDROGENATION — LIQUEFACTION—Dr. Friedrich Bergius, Germany—Early History of Hydrogenation. Prof. A. Gillet, Belgium—The Dispersion of Coal in a Liquid Medium. J. Ivon Graham & D. G. Skinner, England—Further Investigations of the Action of Hydrogen upon Coal. André Kling and Daniel Florentin, France—Catalysts in Hydrogenation Cracking. Dr. Hans Tropsch, Czechoslovakia—Catalysts for High Pressure Reduction and Hydrogenation of Phenols and Hydrocarbons.

BY-PRODUCTS—Prof. Dr. H. Mallison, Germany—The Chemistry and Physics of Tar for Use in Road Construction. Prof. A. W. Nash, England—Synthesis of Lubricating Oils from Coal and Its Gaseous Products. Dr. L. V. Redman, United States—Subject to be announced later.

FERTILIZER—C. J. Brand, United States—The Fertilizer Industry as an Outlet for Coal and Its Derivatives. The Koppers Co., United States—Subject to be announced later.

CARBONIZATION—Dr. H. C. Porter, United States—Varying Flow Property of Coals in the Softened State. Prof. R. V. Wheeler and Dr. J. H. Scholtz—Carbonization of Bituminous Coal in Streams of Gases. Prof. Wheeler and R. A. Mott, England—Blending of Coals for Coke Making.

Low Temperature—C. M. Ab-der-Halden, France—Continuous Low Temperature Distillation in a Rotating Hearth Furnace. P. C. Pope, England—Present Status and Future Prospects of Low Temperature Carbonization in England. F. Puening, United States—Low Temperature Carbonization. Dr. R. P. Soule, United States—Lessons from Low Temperature Carbonization.

High Temperature—Dr. K. Baum, Germany—Fuel Economy in German Coke Plants. C. Berthelot, France—European Progress in the Technique of Coal Carbonization. A. C. Fieldner and J. D. Davis, United States—The Relation of Chemical and Physical Tests of Coal to Coking Properties and By-Product Yields. John Roberts, England—Blending: With Special Reference to the Davidson Rotary Retort. Prof. P. Schlaepfer, Switzerland—Influence of the Various Constituents of Coal on Its Swelling and Coking Power. Dr. G. Stadnikoff, U. S. S. R.—General Considerations on the Fusibility and Coking of Bituminous Coals. Dr. Ernst Terres, Germany—Coke Formation. Prof. R. V. Wheeler and T. G. Woolhouse, England—Effect of Oxidation of the Coking Properties of Coal. Prof. Dr. J. P. Wibaut, Holland—On the Forms of Sulphur and Nitrogen in Coke and On the Fixation of Sulphur and Nitrogen by Amorphous Carbons at High Temperatures.

GASIFICATION—Dr. M. Barash and T. A. Tomlinson, England—Steaming in Continuous Vertical Retorts. Prof. Dr. M. Dolch, Germany—Tar Decomposition and Its Relation to Gasification. G. Egloff and A. Fisher, United States—The Simultaneous Cracking, Carbonization and Gasification of Coal and Oils. Prof. Dr. H. G. Grimm, Germany—Gasification of Coal in the Wrinkler Generator. Prof. Dr. J. Gwosdz, Germany—The Complete Gasification of Coal with Special Reference to the Utilization of the More Reactive Fuels for the Preparation of Hydrogen-rich Gases. N. E. Rambush, England—Large Capacity Water Gas Generators in Great Britain. L. H. Sensicle, England—Intermittent Vertical Chamber Ovens; Some Recent Developments. Prof. G. V. Slottman, United States—Improvements in Gas Producer Control. Dr. A. Thau, Germany—Production of Water Gas from Powdered Fuel.

COMBUSTION—*Gas*—Prof. Dr. E. Berl, Germany—The Formation and Combustion of Hydrocarbons.

Pulverized Coal—E. G. Bailey and R. M. Hardgrove, United States—The Slag Tap Furnace and Its Effect upon the Selection of Coal for Pulverized Coal Firing. Andre Grebel, France—Study of the Mechanism of the Combustion of Pulverized Coal. R. Pawlikowski, Germany—Progress of the Coal-Dust Motor. R. A. Sherman, United States—An Experimental Study of the Process of Combustion of Pulverized Coal. Ch. M. Stein, France—High Speed Pulverizers for Use in Cement Kiln Firing. T. Suwa, Japan—Combustibility of Powdered Coal as a Fuel for the Coal Dust Engine. E. H. Tenney, United States—Theoretical and Practical Aspects of Pulverized Coal Firing.

Coal and Coke—Dr. S. P. Burke, United States, and Dr. T. E. W. Schumann, South Africa—The Mechanism of Coal Combustion. Bert Houghton, United States—The Burning of Bituminous Coal on Large Underfeed Stokers. Harald Nielson, England—High Combustion Densities in Restricted Furnace Space. F. Schulte, Germany—Development of Grate Firing in Germany.

Domestic—A. R. Mumford, United States—Subject to be announced later. G. A. Young and W. T. Miller, United States—Studies of Small Stokers for Bituminous Coal.

RAILWAY AND STEAMSHIP FUEL—J. C. Chapple, United States—Pulverized Coal for Locomotives. C. J. Jefferson and R. D. Gatewood, United States—Use of Coal on Shipboard. Richard Roosen, Germany—Dynamometer and Road Results with Stug Pulverized Fuel Fired Locomotives. Ch. M. Stein, France—European Progress in the Use of Powdered Coal in Steamships. F. M. Waring, United States—Future Use of Coal as Locomotive Fuel. H. C. Woodbridge and Associates, United States—Railway Fuel.

SMOKE ABATEMENT, DUST REMOVAL AND FLUE GAS PURIFICATION—V. J. Azbe, United States—Rationalizing Smoke Elim-

ination Methods. C. H. Desch, England—Prevention of Smoke in Metallurgical Operations. Dr. H. F. Johnstone, United States—The Elimination of Sulphur Compounds from Boiler Furnace Gases.

ORIGIN, CLASSIFICATION AND PROPERTIES—A. deAlvarado and L. M. Puget, Spain—Bituminous Layers in the Coal Basin of Puerta Llano, Spain. Hilding Bergström, Sweden—Spontaneous Ignition of Wood and Origin of Fusain. Prof. Dr. Ernst Berl, Germany—The Origin of Coal. Artificial Production of Substances Similar to Bituminous Coal and Petroleum. Dr. Hans Bode, Germany—Classification of Coals. Dr. Franz Fischer, Germany—Biology and Coal. Dr. E. S. Grumell, England—Classification of British Coals. H. G. A. Hickling, England—Subject to be announced later. H. J. Rose, United States—Coal Classification. Prof. D. Wieluch, Poland—The Chemical Nature of Coal and the Theory of Coal Formation.

COMPETITION OF COAL WITH OTHER FUELS.—Ford, Bacon and Davis Representative, United States—Subject to be announced. R. B. Harper, United States—Competition Between Natural Gas and Coal. G. A. Orrok, United States—Economics of Water Power versus Steam Power. Dr. W. T. Thom, Jr., United States—The Interrelationships of Coal, Petroleum and Natural Gas.

ECONOMICS—F. G. Clark, Canada—Industrial Use of Off-Peak Power. W. H. Young, United States—Subject to be announced later.

METALLURGY—H. C. Armstrong, England—Some Fuel Problems in Metallurgical Practice.

STREAM POLLUTION—Dr. Bach, Germany—The Disposal of Coal Mine Liquid Wastes.

MISCELLANEOUS—Charles E. Bockus, United States. Dr. W. H. Cadman, England. Prof. W. Gothan, Germany. Leopold Herry, Belgium. Waldemar Kaempffert, United States. Dr. R. Lossing, England. Dr. Friedrich Münzinger, Germany—The Influence of the Competition Between Brown Coal and Bituminous Coal on the Production of Electricity in Germany. Dr. F. S. Sinnatt, England—Some Aspects of Fuel Research.

R. C. Hoffman, Jr., Made Official

R. C. HOFFMAN, JR., vice-president of the Southern Cities Public Service Corporation, a subsidiary of the Central Public Service Corporation, has been promoted to the general executive staff of the later organization, and while attaining complete direction of the utilities comprising the Southern Cities group, will assume additional duties which have necessitated his immediate removal of his headquarters to Chicago.

Mr. Hoffman, a former member of the Board of Directors of the American Gas Association, will retain an office in Atlanta.

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AMERICAN GAS ASSOCIATION

420 Lexington Avenue

New York City

World's Largest Cake Baked by Gas

JUST the kind of a cake small boys and girls dream about before their birthdays—that is the sort of cake recently baked in Rochester, N. Y., for featuring at the Orleans County Fair at Albion, N. Y., in the Lockport District, of the Associated Gas and Electric System. Incidentally, the baking of this huge cake—which was 8 ft. in diameter and 12 ft. high, and weighed 3½ tons—was performed at the Wehle Baking Company, in Rochester, on a large Peterson gas-fired traveling conveyor type oven, 10 ft. wide and 70 ft. long. The baking of the cake was under the supervision of John F. Woggon, and the "trimming" and decorating was the work of Herman Thorschmidt, of Rochester, who happens to be the champion catch-as-catch-can cake trimmer of this country. Mr. Thorschmidt is thus recognized in the baking industry, and often is called to the larger cities of this country to garnish some unusually interesting or unique product of the bakers art. At one time he was purveyor of food for the royal tables of Germany.

The huge cake contained 1600 lbs. of flour, 1140 lbs. of sugar, 910 lbs. Snowdrift shortening., 7272 eggs, 455 qts. of milk, 1000 lbs. of apple sauce, 100 lbs. baking powder, 500 lbs. sugaricing, 1 gal. vanilla, 1 gal. lemon and 56 lbs. of fluff-up chocolate and white fudge.

Machines were kept busy hours mixing up this cake, which was baked in sections in large flat bake pans. It took more than 6 hours to complete the baking process. Later, the pieces were assembled, the apple sauce filling put in, and the very artistic decorating accomplished. Then, after the cake had been on display at the Fair for some time, it was cut into small pieces and put into boxes and many of them sold to interested Fair patrons. A large number of boxes were sent to various parts of the country to advertise the quality of Orleans County apples.

Quite naturally, with a cake as big as this, there would be some up-to-date young couple who would welcome the opportunity it afforded to tell their grandchildren about such a marvelous "wedding cake." Therefore, Miss Hazel Moore and Walter Murray, of Lyndonville, decided to get married, cut themselves a piece of cake, and make themselves "at home" forever after.

More than $500 was taken in selling cake, and much more than that amount of good publicity was earned for Orleans County apples. Incidentally, the use of gas, perhaps the only fuel which could successfully bake such a monster cake, received noteworthy impetus; Rochester's cake trimmer extraordinary was on the receiving end of sufficient "Ohs and Ahs" and other superlative expressions of appreciation to keep him enthusiastic about his calling until the next big cake is ordered, and—everybody's happy, including the board of directors of the Orleans County Fair, which sponsored this unusual activity.

Inasmuch as the large oven used to bake the cake was a bread oven, the services of the Industrial Sales Department of the Rochester Gas and Electric Corporation were utilized in preparing and baking the cake. Clinton Cole, of that department, worked with the Wehle Baking Company in assuring the successful use of the oven for this purpose.

A souvenir box used in distributing tasty cuts of the cake was supplied by the Associated Gas and Electric System. Upon the box was printed the important facts connected with "The World's Largest Cake," baked by the world's renowned pastry cook, H. Thorschmidt.

What's Within the Gas Range

An illustrated booklet on the modern gas range—full of unbiased, general information which should bring about a better understanding of gas as a cooking fuel, and an appreciation of the modernity of the range.

Copies of the booklet may be secured in any quantity at the following costs:

10¢	each	up to	100
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8½¢	each	1000 to	2500
8¢	each	2500 and over.	

Company name may be imprinted on the back cover for slight additional cost.

For Further Information Write to

American Gas Association
420 Lexington Avenue
New York, N. Y.

Affiliated Association Activities

Convention Calendar

Wisconsin Utilities Association,
Women's Conference,
Green Bay, Wis.
October 8 and 9.

American Gas Association,
Atlantic City, N. J.
October 12 to 16.

Mid-West Gas Association,
Gas Meter Short Course and Conference,
Iowa State College,
Ames, Iowa.
December 8 to 11, 1931.

Wisconsin Utilities Association,
Commercial Section,
Hotel Lorraine,
Madison, Wis.
October 22 and 23.

American Petroleum Institute,
Stevens Hotel,
Chicago, Ill.
November 10 to 12.

Bituminous Coal Conference,
Pittsburgh, Pa.
November 16 to 21.

Utility Association Secretaries,
Milwaukee, Wis.
November 30 and December 1.

Heating and Ventilating Exposition,
Cleveland Auditorium,
Cleveland, Ohio.
January 25 to 29, 1932.

Pacific Coast Gas Association

THE first business meeting of the convention was held Tuesday morning, September 1, at which Jas. L. Stone, vice-president and general manager of the Spokane Gas and Fuel Company, Spokane, Washington, was elected president of the organization, succeeding R. E. Fisher, of the Pacific Gas & Electric Company. Harry L. Masser, vice-president and executive engineer of the Los Angeles Gas & Electric Corporation of Los Angeles, was elected vice-president, and W. C. Hornberger of Phoenix, Arizona; F. A. Banks of Los Angeles; A. E. Hollaway of San Diego and J. B. Wilson of Santa Cruz, were elected to the directorate. D. G. Martin, of San Francisco, was re-elected treasurer.

In his opening address, President Fisher stated that the depressed condition of business served to emphasize the stability of the nation's public utilities and the soundness of private ownership of utilities supervised by public regulation. He pictured the public utility, owned by thousands of stockholders, managed by experts and controlled in its every action by public authority, as being the type of economic unit which, if extended to other types of business, would do much to cure the economic muddle of our business depressions. He told the association that in spite of the business depression, gas sales on the Pacific Coast have increased by nearly two per cent in 1931 over 1930 and the number of customers has increased over two per cent. The decrease of four per cent in revenue was ascribed partly to the depression but more largely to the radical rate reductions resulting from the substitution of natural for manufactured gas in Northern California.

Peanut Vendor Modernizes with Gas

AMONG the novel gas installations at Port Townsend, Washington, is that of a gas-fired peanut roaster, owned by Peter Sofie.

Sofie's place of business is along the water front, and with the advent of air butane gas in this territory, he expressed the desire to take advantage of the comfort and convenience of this new fuel, along with other consumers in this area. Therefore, arrangements were made with W. E. Meaney, local representative of Natural Gas Corporation of Washington, to install an 18-inch Johnson tube burner for the heating unit. Sofie now declares the peanuts roasted have a better flavor and are more evenly cooked than with any other fuel he has ever used.

This roaster was originally purchased in 1885, operating with gasoline, and has changed hands but twice during this entire period. Now, like so many other appliances, it has been "modernized with gas," with a cost of operation averaging only about $1.50 per month.

Instructions for Testing and Repairing Gas Meters

■

Compiled by
GEORGE A. LANE
and
WILLIAM A. CASTOR

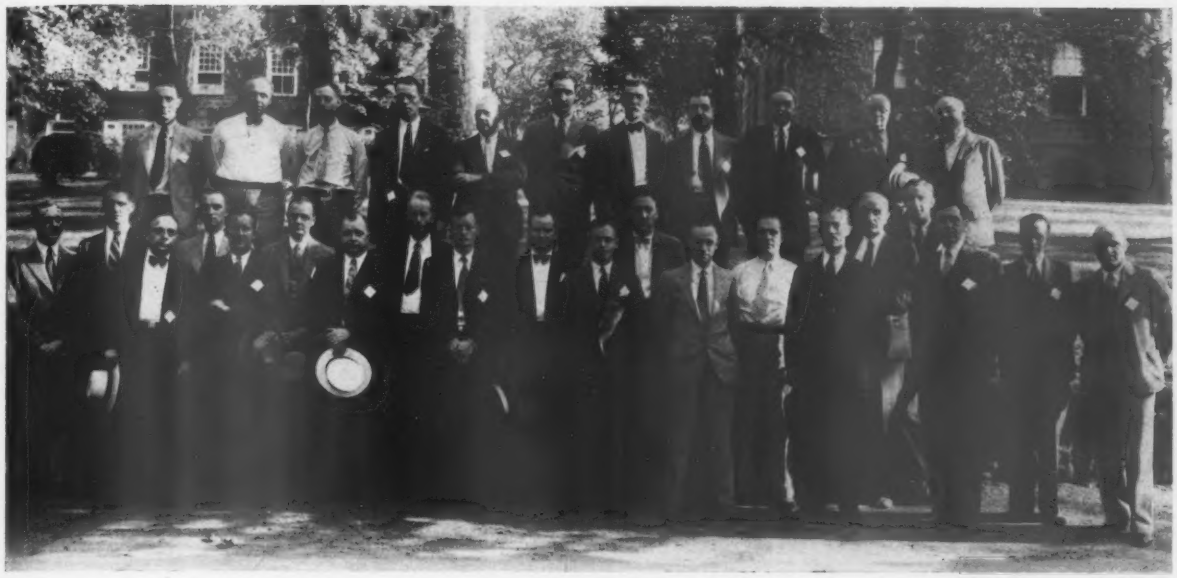
■

PUBLISHED BY
AMERICAN GAS ASSOCIATION

■

Twenty-five Cents Per Copy

Utility Men Hear of A. G. A. Course at Rutgers University



Utility representatives at the Industrial Extension Conference, Rutgers University, September 11, at which unusual success of the American Gas Association Elementary Course on Manufactured Gas was reported

This Sales Management Training Program Provides the Information You Need

"Sales Administration and Management in the Gas Industry" brings you the facts about your job that are essential to your full success.

It brings you *first hand information about the successful methods used by men in positions similar to yours* in other companies in controlling their sales forces—in hiring salesmen, training them, developing them, helping them.

It describes the policies and methods in use by sales executives in other companies under all sorts of conditions, and analyzes their results. In this way, the Course prevents wasteful experiments; *it gives you the benefit of the combined sales experience of the most successful companies* in the whole gas industry.

It goes to the very root of the sales problem, shows how the chief executives of your company form their sales plans, discusses the reasons behind those plans, and points out *what you can do to give full cooperation to your company's sales program.*

The Material of the Course Comes Direct from the Field

In order to prepare the Course, a nation-wide Survey was first conducted. Scores of representative manufactured and natural gas companies were visited. In each company, domestic, commercial, house heating, and industrial sales executives of all ranks were interviewed at length and watched at work; their plans were studied, their methods observed, and results noted.

The vast amount of information thus collected has been sifted, analyzed, and summarized readably and interestingly in the Course.
The Course is divided into eight sections, or Units, issued separately. *Each Unit is practical, full of meat, and deals with some important element in your work* or your relations with the work of others.

Unit I—Measuring the Sales Job
Planning and Management—Functions of the Sales Executive—Planning for Profitable Expansion—Analyzing the Market—Forecasting Sales and Revenues.

Unit II—Establishing Sound Selling Policies
Establishing a Coordinated Program—Markup and Accounting Policy—Dealer Relations—Trade-ins and Term Payments.

Unit III—Increasing Load Through Salable Appliances
Finding the Right Appliance—Buying and Controlling Stock—Displaying Stock—Developing and Controlling Service.

Unit IV—Building up the Sales Force
Specifications for Salesmen—Finding and Selecting Salesmen—Training New Salesmen—Setting Up Quotas—Finding Prospects—Organizing Field Work—Standards of Performance.

Unit V—Increasing the Effectiveness of the Sales Force
Weeding Out Weak Men—Developing Morale—Stimulating Salesmen—Helping Salesmen—Utilizing Manufacturers' Aids—Directing Salesmen.

Unit VI—Providing Sales Aids
Sales Equipment—Manuals—Advertising—Mail Promotion—Utilizing Home Service—Utilizing the Engineering Staff.

Unit VII—Developing Sound Customer Relations
Giving Real Service—Handling Complaints—Improving Relations with Industry—Cooperating in Community Movements—Broadening Good Will.

Unit VIII—Preparing for Further Progress
An Analytical Summary of Replies to the Experience Reports which accompany each Unit of the Course—An Interpretation of the Replies—A Program for Growth.

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COMMERCIAL SECTION

AMERICAN GAS ASSOCIATION, 420 Lexington Avenue, New York, N. Y.

Testing Laboratory
R. M. CONNER, Director
MANAGING COMMITTEE
J. S. DEHART, JR., Chairman N. T. SELLMAN, Secretary

Review of Laboratory's Activities During Past Year

By F. R. WRIGHT,
Publication Editor, A. G. A. Laboratory

PROBABLY the most important development in the American Gas Association's Laboratory program during the past year was the opening on May 3 of a Pacific Coast branch in Los Angeles, California. This new unit is now completely equipped to test all types of domestic gas appliances. The first four months of its operations indicates that it will be an important factor in serving the appliance testing needs of the Pacific Coast States.

The amount of testing work completed by both Laboratories in August exceeded that of the corresponding period in 1930 by more than 44 per cent. Last month was the twenty-third consecutive month wherein the testing activities exceeded those of the corresponding period of the preceding year. This is rather remarkable since it covers a period when general business conditions have shown a decided downward trend. This expansion in the number of appliances tested not only indicates increased interest and support of the Association's testing and approval program but it is also evidence of a determined and united effort on the part of appliance manufacturers to stimulate active interest in their products.

Although the number of Approval Requirements Committee meetings were reduced to a minimum during the past fiscal year, considerable progress was made in the revision of existing requirements and the preparation of new ones. Revised requirements for Space Heaters and Incinerators were published on December 1 and May 1, respectively. New approval requirements have been completed for gas ranges designed to utilize propane and butane-air gas, and the existing gas range requirements have been revised and brought up to date.

New requirements for the installation of conversion burners in house and water heating appliances have been completed, and approval requirements for hotel and restaurant ranges and garage heaters soon will be in final form ready for release to the industry. The drafting of A. G. A. Approval Requirements for Industrial Gas Boilers as well as Gas Refrigerators are also now well under way. With the completion of these specifications practically every type of domestic as well as two types of industrial gas appliances will be covered by approval requirements.

Research in mixed gases is being continued. Recent activities of this nature have been devoted primarily to the use of butane for augmenting purposes and as a carburetant for air and low-heating value gases. To date more than 300,000 tests have been made in this work.

The pipe joint research program, which was initiated in 1929, was continued during the past fiscal year. This work, which has had for its aim the development of the best means of repairing old joints and the making of new ones, has progressed to a point where definite recommendations can now be made. It has included research in the repair of all sizes of bell and spigot joints and the making of new joints in the 4- and 16-inch sizes, together with the investigation of various patented joints. Plans have been made to extend this work to cover arc and oxy-acetylene welded joints for steel pipe.

Investigations of three industrial gas utilization problems are also under way. Two of these—a determination of the characteristics of burning gas with preheated air and the elimination of burner noise in industrial gas burners—were continued from last year. The third, covering combustion space requirements for industrial gas furnaces, is now also under way.

Research in the development of Approval Requirements has been both diversified and extensive. This has included an investigation of the construction and performance of a number of industrial gas boilers, garage heaters, hotel and restaurant ranges, gas ranges, and gas steam radiators, as well as a study of many minor problems. Research in the development of a suitable method for rating gas steam radiators was carried on largely at Purdue University because of the necessity for a constant temperature room.

The comparative advantages of gas and electric service for certain household heating operations have been the source of considerable comment in recent years. The merits of the two types of service for domestic cooking were investigated by the Laboratory in 1928 and a report issued covering this subject. Early this year a further study was made of the literature and data published in both this country and abroad and a series of tests, simulating as nearly as possible actual service conditions, were made on both gas and electric ranges and gas and electric water heaters. Modern appliances of both types designed for similar service were used. The results of these tests are included in a report which is probably the most complete of any issued to date on such subjects.

All in all the past year has been a most active one for the Laboratory. This fact and the results accomplished seem to indicate a growing appreciation on the part of gas companies and appliance manufacturers in the value of its accomplishments and the importance of its place in the industry.

Laboratory Staff Enjoys Picnic

THE Laboratory Staff held its annual picnic this year at the Big Ten Alumni Club, Lake Shore Boulevard and Eddy Road, Bratenhal, on Friday, August 28.

Included on the program were men's and women's golf tournaments, tennis tournament, bridge tournament, swimming, boating and numerous other sport events. A delightful banquet was held at the Club House in the evening followed by dancing in the club ball room.

A large number of most appropriate prizes for winners of the various events were personally provided by R. M. Conner, laboratory director. These were distributed in the dining hall immediately following the banquet. C. S. Stuckenholt, Laboratory foreman, acted as master-of-ceremonies.

The various competitive events and the winners were as follows:

Men's golf tournament, E. A. Luscombe, engineer; women's golf tournament, Icona Andrews, stenographic department; tennis tournament (first prize), H. E. Thompson, testing engineer; tennis tournament (second prize), R. C. Kyle, testing engineer; lowest net score men's golf tournament, F. E. Vandaveer, laboratory supervisor; highest net score men's golf tournament, W. F. Twitchell, testing engineer; bridge tournament (high score), Mrs. Mildred Lingo; bridge tournament (low score), Mrs. G. N. Davis; men's golf putting contest, John Wilson, shipping clerk; women's golf putting contest, Mrs. E. A. Luscombe; men's running race, H. J. Hill, testing engineer; women's running race, Mrs. Evelyn Lezsak, stenographer; wheelbarrow race for men, R. C. Gregg and H. L. Roahrig, testing engineers; women's baseball throwing contest, Mrs. Evelyn Lezsak, stenographer.

Commercial Section

E. R. ACKER, Chairman — J. W. WEST, Jr., Secretary — SAMUEL INSULL, Jr., Vice-Chairman

Southwest Regional Sales Meet Opens November 16

THE Second Southwest Regional Sales Conference, sponsored by the Commercial Section of the American Gas Association, will be held at the Hotel Arlington, Hot Springs, Arkansas, on Monday and Tuesday, November 16 and 17, 1931.

At a meeting of the Council in charge of this activity held at Hot Springs on September 15, an excellent program of speakers on sales subjects was laid out under the chairmanship of Sterling A. Lipscomb, Little Rock Gas and Fuel Company, Little Rock, Arkansas.

Membership of the Council includes: J. B. Allison, Kansas Pipe Line and Gas Co., Salina, Kans.; Q. R. Dungan, The Empire Cos., Bartlesville, Okla.; H. D. Ittner, Texas Public Service Co., Austin, Texas; W. Jennings Young, Oklahoma Natural Gas Corp., Tulsa, Okla.; C. L. May, Community Natural Gas Co., Dallas, Texas; J. F. Orr, United Gas System, Houston, Texas; C. K. Patton, Texas Cities Gas Co., Dallas, Texas; Elliott G. Peabody, Baton Rouge Electric Co., Baton Rouge, La.; R. E. Sivley, San Antonio Public Service Co., San Antonio, Texas; P. C. Tucker, Arkansas Power & Light Co., Pine Bluff, Ark.; E. C. Whitcomb, Lone Star Gas Co., Fort Worth, Texas; C. B. Wilson, Southern Cities Distributing Co., Shreveport, La.

One entire session of the conference will be devoted to the subject of house heating and air conditioning and another will discuss the status of trade and dealer cooperation activities. Other subjects on the program include "Advertising for Future Sales," "Holding and Developing the Industrial Load," "Selecting, Training and Organizing the Sales Force," "Promoting Gas Refrigerator Sales in the Southwest" and "Reports from the Firing Line" by two gas appliance salesmen.

Advance notices of the conference carrying the final program will shortly be mailed to members throughout the Southwest region. The conference covers the states of Louisiana, Texas, Arkansas, Missouri, New Mexico, and Oklahoma.

Statement of the Ownership, Management, Circulation, Etc., Required By the Act of Congress of August 24, 1912

Of American Gas Association Monthly published monthly at Brattleboro, Vt., for October 1, 1931.

State of New York, County of New York, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Allyn B. Tunis, who, having been duly sworn according to law, deposes and says that he is the Editor of the American Gas Association Monthly and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, American Gas Association, Inc., New York, N. Y.; Editor, Allyn B. Tunis, New York, N. Y.; Managing Editor, None; Business Managers, None.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

American Gas Association, Inc., 420 Lexington Avenue, New York, N. Y.; C. E. Paige, President, American Gas Association, 420 Lexington Avenue, New York, N. Y.; Vice-Presidents, R. W. Gallagher, N. C. McGowen, Arthur Hewitt, 420 Lexington Avenue, New York, N. Y.; Wm. J. Welsh, Treasurer, 420 Lexington Avenue, New York, N. Y.; Alexander Forward, Managing Director, 420 Lexington Avenue, New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is . (This information is required from daily publications only.)

ALLYN B. TUNIS, Editor.

Sworn to and subscribed before me this 22nd day of September, 1931.

(Seal)

LAWRENCE P. BROWN,
Notary Public, New York County,
Clerk's No. 464, Register's No. 2B332,
(My commission expires March 30, 1932.)

455 Enroll in Industrial Gas Salesmanship Course

This course is designed to develop Sales Technique in gas company personnel responsible for Industrial, Hotel and Restaurant, and Large Volume gas sales generally.

For further information address

INDUSTRIAL SECTION

AMERICAN GAS ASSOCIATION

420 Lexington Avenue
New York, N. Y.

Accounting Section

J. I. BLANCHFIELD, Chairman H. W. HARTMAN, Secretary WILLIAM A. DOERING, Vice-Chairman

Customers Accounting Systems to Be Discussed

PLANS have been completed for the one-day meeting for discussion of customers accounting plans, which will be sponsored by the Accounting Section Committee on Development of Mechanical Office Equipment, in the Atlantic City Auditorium, Atlantic City, N. J., on Monday, October 12. The morning session will open at 10:30 and the afternoon session will start at 2:00 o'clock.

It is the purpose of the meeting to present to the accountants of the gas industry a cross-section of the most efficient customers accounting systems in use. Each of the systems that will be presented was suggested by the accounting machine company whose equipment was employed as being a thoroughly typical and efficient installation. Each presentation will be made by an executive of the utility company whose system is being described.

The morning session will be opened by John I. Blanchfield, Brooklyn Union Gas Company, chairman of the Accounting Section. Following Mr. Blanchfield's remarks will be an address on "Accounting Machine Developments" by Herbert E. Cliff, Public Service Electric and Gas Company, who as chairman of the committee will preside at the meeting.

C. L. McGowan will present a paper describing the Remington post card customers accounting plan in use at the Equitable Gas Company and Duquesne Light Company, Pittsburgh, Pa. The Elliott Fisher customers accounting plan will be offered by H. F. Frey of the Allentown-Bethlehem Gas Company, Allentown, Pa.

The first paper of the afternoon session will be that of H. L. Dalbeck who will describe the Remington Powers punched card plan of the New England Gas and Electric System, Cambridge, Mass. The Hollerith punched card plan will then be submitted by G. A. Burrows of the Consolidated Gas Company of New York, New York, N. Y. H. B. Bearden is to describe the Burroughs stub plan as practiced by the Laclede Gas Light Company, St. Louis, Mo.

Discussion from the floor will be invited after the presentation of each paper. The speakers will gladly answer questions or expand on any part of the accounting procedure that might be the subject of discussion.

All members of the Accounting Section are cordially invited to attend the meeting. Those who are interested in customers accounting and who want to obtain a thorough knowledge of the various systems in use throughout the country will find this meeting especially profitable.

Wisconsin Heat Value Standard

ONE of the eleventh-hour matters slipped through the 1931 session of the Wisconsin Legislature was joint resolution 166-A, relating to the State standard of heat value for gas.

On Sept. 8, 1920, the Railroad Commission of Wisconsin, in an order, modified the former standard of 600 B.t.u. and authorized a minimum standard of 520 B.t.u. In this order the Commission pointed out the fact that there was a crisis due to shortage of oil and coal and that deposits of naphthalene and hydrocarbons were worse with the higher heat value gas. It also pointed out that a more uniform gas could be supplied at the lower heat values, that testimony showed there would be practically no difference in the residence customers' monthly bill for service, that the lower heat value was more economical and that raw material could be conserved. The order was made temporary, so that if the lower standard proved inadequate, further change could be ordered.

The joint resolution already mentioned called attention to the shortage of fuel and the temporary nature of the order without calling attention to the other factors taken into consideration by the Commission. The resolution on this basis declared that the emergency of ten years ago had passed and that it would be to the best interests of the public to return to the former standard of 600 B.t.u. The resolution directed the Public Service Commission "to take such steps as may be necessary to re-establish the original heating standard of 600 B.t.u. . . . at the earliest possible moment."

This resolution was introduced on June 19, 1931, read and adopted the same day with no opportunity for hearing. On June 24, it was read and concurred in by the Senate. Thus in the closing days of the session, this resolution was passed and became effective before it was printed or an opportunity was given the companies concerned to present arguments on the subject.

Of course, a joint resolution does not have the same force as a bill, but the Commission must set a hearing and investigate the matter, issuing such order as the investigation warrants. It is understood that the hearing may be held this month.

N. J. Gas Association Aids Rutgers Fellowship

THE New Jersey Gas Association, an organization composed of nine gas companies throughout the state, has contributed $1,500 for the establishment of an industrial fellowship at Rutgers University, New Brunswick, the object of which will be a systematic and thorough study of the value of gas works by-products.

Dr. C. W. Griffin, a chemical engineer and a former teacher of chemistry at one of the southern colleges, has been selected as the fellow under the terms of the fellowship. Dr. Griffin has successfully carried on several research projects associated with chemical engineering.

The research work will be carried on under the supervision of the New Jersey Agricultural Experiment Station and the dean of the School of Chemistry of Rutgers University.

W. E. Boyd, industrial engineer, formerly with the Texas Cities Gas Company at El Paso, (Tex.) has been appointed manager of the sales and gas appliance department of the Fort Stockton (Tex.) Gas Company. His assisting salesmen will be John Kitson and M. Sturm.

W. S. Van Sickel has been elected to succeed Robert C. Coffy as vice-president and general manager of the Mississippi Valley Power Company and president of the Fort Smith Traction Company.

Gas Appliance and Equipment Developments

Bailey Ratio Meter

A recent and important development of the Bailey Meter Company, Cleveland, Ohio, is the Bailey Ratio Meter for use as a combustion guide in the firing of gas- or oil-fired heaters, kilns, and all types of industrial furnaces.

Welding Torch and Cutting Attachment

The Linde Air Products Company, 30 East 42nd Street, New York, N. Y., recently has made two new additions to its line of Purox medium pressure apparatus for oxy-acetylene welding and cutting. The new Purox No. 11 Welding Torch, which supersedes the Purox No. 10 Torch, has a wide welding range extending from the lightest sheet metal up to work as heavy as ½ in. plate. The Purox No. 21 Cutting Attachment designed for use with the Purox No. 11 Welding Torch will cut metal up to 2 in. in thickness.

To Show Ditcher at Convention

The Barber-Greene Company of Aurora, Illinois, plans to exhibit at this year's A. G. A. Convention at Atlantic City its new small service special vertical boom ditcher complete with light four-ton trailer for transportation. The new ditcher is only 4′ wide and 11′ 6″ long, and, when digging, is no higher than a tall man's head. It is used especially for cutting gas service, having a maximum trench depth of 3′ or 3′ 6″, and a width of 5″ or 8″-11″. It has a wide range of digging speeds from 14″ to 12′ per minute.

Air Conditioning Unit

The Bryant Heater & Manufacturing Company, Cleveland, O., has announced a new addition to its line of gas boilers and furnaces. The new unit, known as the Bryant Dualator, is a complete air conditioning unit for residential work, adaptable either to straight air conditioning or a combination of air conditioning and radiator heating.

Appointed Sales Engineer

Eugene W. Stitt has been appointed sales engineer of the newly established Gas Heating Division of the National Radiator Corporation, Johnstown, Pa.

Chain Changes to Automatic Heaters

The Spencer Thermostat Company, Attleboro, Mass., announces that arrangements have been made at the headquarters of the Liggett Drug Stores for converting all of the manually operated tank heaters in their chain of stores into automatic water heaters, using the Klixon conversion kit. There are 560 Liggett stores in which manually operated gas heaters provide hot water for soda fountain and restaurant purposes.

Contributions of news items by manufacturers of gas appliances and equipment to this department will be welcomed by The A. G. A. Monthly. On account of space limitations, all announcements of new products, improvements, etc., should be limited to about 100 words. No attempt will be made to describe each product or give details of construction. For such details address the manufacturer direct. Where justified, photographs will be used to illustrate these brief items. All contributions to this department should be addressed to C. W. Berghorn, Secretary, Manufacturer's Section, American Gas Association, 420 Lexington Ave., New York, N. Y.

Worthington Acquires Metalweld

It has been announced that the Worthington Pump and Machinery Corporation, Harrison, N. J., has acquired the manufacturing and marketing facilities of Metalweld, Inc., Philadelphia, Pa., builders of a complete line of portable compressor units.

New Type Furnace

A new type of gas furnace, one that will be within the reach of the lower income classes, has recently been announced by The Forest City Foundries Company of Cleveland. This new warm air, gas-fired unit is the Niagara Junior Auxiliary Gas Furnace. It is designed for installation beside the present coal furnace, connected to the latter's casing at top and bottom, so that either or both can be used.

Home Incinerator Change

In order to correct any misunderstandings that may exist, the Kohn Manufacturing Company, of Milwaukee, Wisconsin, announces that its sales contract with the Home Incinerator Company has been terminated and it has set up its own sales organization for the Home Incinerator.

Meter Repair Parts

The Lambert Meter Co., Bush Terminal Building, Brooklyn, N. Y., announces that it has added a new department to its company which is now prepared to supply meter repair parts for all sizes of meters and most makes of meters.

New Line of Blowers

The new WAFFCO line of housed-in furnace blowers, with and without the patented Miles by-pass louvers, has been announced by The Warm Air Furnace Fan Company, of Cleveland, O., manufacturers of Miles Automatic Furnace Fans and Miles Centrifugal Furnace Blowers, to meet the needs of a rapidly developing forced air market.

Hooper Joins Barber-Greene

The Barber-Greene Company of Aurora, Illinois, manufacturers of material handling equipment, announce the appointment as General Sales Manager of F. D. Hooper, formerly sales manager of the Lidgerwood Manufacturing Company of Elizabeth, New Jersey.

New Type Gas Oven

The Union Steel Products Co., Albion, Mich., announces a new two-deck peel type gas oven, coming out by this company embodying features of the Roberts Black Diamond gas oven, and the Superior gas oven, together with some interesting new features developed by C. T. Hatch, general superintendent of the company.

To Stage Gas Exhibit in Northern Indiana

Established Northern Indiana heating contractors, manufacturers of gas home heating equipment and the Northern Indiana Public Service Company held an exhibit of gas heating equipment last month on the sales floors of the Northern Indiana Public Service Company in Hammond and South Bend.

The exhibit in Hammond was held September 17-19, inclusive, and invitations were extended contractors from Hammond, East Chicago, Whiting, Indiana Harbor, Gary, Hobart, Michigan City, Valparaiso, Chesterton, Porter and Crown Point.

The South Bend exhibit took place the following week, that is Tuesday and Wednesday, September 22 and 23. Heating contractors were invited to attend from South Bend, Mishawaka, Elkhart, Nappanee, Bremen, Goshen, Warsaw, Plymouth and Winamac.

In conjunction with the equipment exhibit to which the public was invited, there was a course on gas heating available for the attending heating contractors and architects. The course, covering a day and a half, was sponsored by Purdue University and prepared and presented by Professor R. B. Leckie, head of the Gas Engineering Department at Purdue and an outstanding authority on gas utilization.

Monthly Summary of Gas Company Statistics

FOR MONTH OF JULY, 1931

Issued September, 1931, by the Statistical Department of the American Gas Association
420 Lexington Avenue, New York, N. Y.

PAUL RYAN, Statistician

REVENUES of manufactured and natural gas utilities aggregated $43,384,142 in July, as compared with $45,358,172 in July 1930, a decline of 4.4 per cent, according to reports to the statistical department of the American Gas Association from companies serving some 13,632,307 customers and representing about 90 per cent of the public utility distribution of manufactured and natural gas.

Revenues of the manufactured gas companies aggregated $28,117,595 for the month, a drop of 2.7 per cent from a year ago. The natural gas utilities reported revenues of $15,266,547, which were about 7.3 per cent under the figures for July 1930.

Sales of manufactured gas reported for July totalled 25,392,978,000 cu.ft., a decline of 3 per cent, while natural gas utility sales for the month were 41,864,835,000 cu.ft., a decline of some 6 per cent.

New England was one of the few sections of the country where conditions ran counter to the general trend. In this region July sales were up 3.4 per cent from the corresponding month of 1930, while revenues increased by more than 2 per cent.

While the Middle Atlantic States as a group registered a decline in sales, in New York State sales of manufactured gas for the month were nearly 2 per cent above the preceding year, while revenues were up 1.6 per cent.

The most marked curtailment in manufactured gas sales occurred in the East North Central States, comprising Illinois, Indiana, Michigan, Ohio and Wisconsin. Total sales for July were down 9 per cent from a year ago, while revenues declined 8.2 per cent. This was the result, in large part, of a drop of 15 per cent in sales to industrial-commercial users.

COMPARATIVE STATISTICS OF 168 MANUFACTURED GAS COMPANIES FOR THE MONTH OF JULY, 1931

	Month of July			*Seven Months Ending July 31*		
	1931	*1930*	*Per cent Increase*	*1931*	*1930*	*Per cent Increase*
Customers	9,087,285	9,076,026	0.1	*See July*		
Gas Sales (MCF)	25,392,978	26,180,099	— 3.0	213,997,273	217,859,368	— 1.8
Revenue (Dollars)	28,117,595	28,888,939	— 2.7	227,283,964	231,869,656	— 2.0
Gas Produced and Purchased (MCF)						
Gas Produced						
(a) Water Gas	10,260,504	10,899,627	— 5.9	104,847,808	108,768,943	— 3.6
(b) Retort Coal Gas	2,565,134	2,392,980	7.2	18,855,431	18,745,590	0.6
(c) Oil Gas	462,068	485,432	— 4.8	4,454,178	4,814,065	— 7.5
(d) Coke Oven Gas	4,172,627	3,876,417	7.6	30,222,914	28,069,690	7.7
(e) Reformed Oil Still Gas	347,559	139,977	—	2,601,115	1,073,810	—
(f) Total Gas Produced	17,807,892	17,794,433	0.1	160,981,446	161,472,098	— 0.3
Gas Purchased						
(a) Coke Oven Gas	7,720,093	8,855,835	—12.8	63,339,463	66,833,698	— 5.2
(b) Oil Still and Natural Gas	385,207	225,807	70.6	2,669,479	1,989,251	34.2
(c) Total Gas Purchased	8,105,300	9,081,642	—10.7	66,008,942	68,822,949	— 4.1
Total Gas Produced and Purchased	25,913,192	26,876,075	— 3.6	226,990,388	230,295,047	— 1.4

COMPARATIVE STATISTICS OF 153 NATURAL GAS COMPANIES FOR THE MONTH OF JULY, 1931

Customers						
Domestic (Including House Heating)	4,324,512	4,295,273	0.7			
Commercial	198,089	185,949	6.5			
Industrial	14,624	14,150	3.3	*See July*		
Main Line Industrial	5,431	5,144	5.6			
Miscellaneous	2,366	2,395	—			
Total	4,545,022	4,502,911	0.9			
Gas Sales (MCF)						
Domestic (Including House Heating)	11,471,190	12,050,233	— 4.8	184,920,782	188,706,192	— 2.0
Commercial	1,546,766	1,695,549	— 8.9	26,355,256	24,317,421	8.4
Industrial	15,331,009	17,598,011	—12.9	112,992,867	132,048,788	—14.4
Main Line Industrial	12,983,777	12,456,673	4.2	88,381,571	107,009,155	—17.4
Miscellaneous	532,093	715,211	—	4,194,076	5,302,654	—
Total	41,864,835	44,515,677	— 6.0	416,844,552	457,384,210	— 8.9
Revenue (Dollars)						
Domestic (Including House Heating)	9,193,151	9,642,280	— 4.7	125,074,979	127,414,160	— 1.8
Commercial	893,578	1,010,790	—11.6	13,141,127	12,770,495	2.9
Industrial	3,359,482	4,123,782	—18.5	26,551,935	32,843,259	—19.2
Main Line Industrial	1,762,449	1,563,306	12.7	11,604,860	13,728,068	—15.5
Miscellaneous	57,887	129,075	—	634,919	1,155,160	—
Total	15,266,547	16,469,233	— 7.3	177,007,820	187,911,142	— 5.8

Associations Affiliated with A. G. A.

Canadian Gas Association
Pres.—Hugh McNair, Winnipeg Electric Co., Winnipeg, Man.
Sec.-Tr.—G. W. Allen, 21 Astley Avenue, Toronto.

Empire State Gas and Electric Association
Pres.—Alfred H. Schoellkopf, Niagara Hudson Power Co., Buffalo, N. Y.
Chairman Gas Section—M. F. Clement, Rockland Light & Power Co., Middletown, Ind.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.

Illinois Gas Association
Pres.—H. A. Kleinman, Peoples Power Co., Moline, Ill.
Sec.-Tr.—George Schwaner, 617 Public Service Bldg., Springfield, Ill.

Indiana Gas Association
Pres.—T. L. Kemp, Indiana Consumers Gas & By-Products Co., Terre Haute, Ind.
Sec.-Tr.—P. A. McLeod, Northern Indiana Power Co., Huntington, Ind.

Michigan Gas Association
Pres.—J. E. Spindle, Grand Rapids Gas Light Co., Grand Rapids, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.

Maryland Utilities Association
Pres.—Adrian Hughes, Jr. Baltimore, Md.
Sec.—D. E. Kinnear, 803 Court Square Bldg., Baltimore, Md.

Mid-West Gas Association
Pres.—John K. Swanson, Minneapolis Gas Light Co., Minneapolis, Minn.
Sec.-Tr.—Roy B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.

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Sec.-Tr.—F. D. Beardslee, 315 N. 12th St., St. Louis, Mo.
Asst. Sec.—Jesse Blythe, 103 West High St., Jefferson City, Mo.

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Pres.—M. B. Webber, Arlington Gas Light Co., Arlington, Mass.
Exec. Sec.—C. D. Williams, 41 Mount Vernon St., Boston, Mass.
Chairman Operating Div.—F. M. Goodwin, Boston Consolidated Gas Co., Boston, Mass.
Sec. Operating Div.—P. R. Buchanan, Hartford Gas Company, Hartford, Conn.
Chairman Sales Div.—J. J. McKearin, Lowell Gas Light Co., Lowell, Mass.
Sec.-Tr. Sales Div.—Robert D. Stuart, Jr., Fall River Gas Works Co., Fall River, Mass.
Chairman Industrial Div.—Chas. H. O'Donnell, Boston Consolidated Gas Co., Boston, Mass.
Sec.-Tr. Industrial Div.—Phillip A. Nelles, Jr., C. H. Tenney Co., Boston, Mass.
Chairman Acctg. Div.—C. N. Alexander, C. H. Tenney & Co., Boston, Mass.
Sec.-Tr. Acctg. Div.—Otto Price, Boston, Mass.
Chairman Manufacturer Div.—A. M. Slattery, The Hoffman Heater Co., Boston, Mass.
Sec.-Tr. Manufacturers Div.—J. H. McPherson, Clow Gasteam Heating Co., Boston, Mass.

New Jersey Gas Association
Pres.—Louis Stoecker, Public Service Electric & Gas Co., Newark, N. J.
Sec.-Tr.—H. E. Cliff, Public Service Electric & Gas Co., Newark, N. J.

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Pres.—L. K. Langdon, Union Gas & Electric Co., Cincinnati, Ohio.
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Pres.—S. I. McElhoes, Southwestern Light & Power Co., Oklahoma City, Okla.
Mgr.—E. F. McKay, 1020 Petroleum Bldg., Oklahoma City, Okla.

Pacific Coast Gas Association
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Mang. Dir.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.

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Pres.—E. S. Templeton, Greenville, Pa.
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Pres.—Edward N. Avegno, New Orleans Public Service, Inc., New Orleans, La.

Southwestern Public Service Association
Pres.—Knox Lee, Southwestern Gas & Electric Co., Marshall, Texas.
Sec.—E. N. Willis, c/o St. Charles Hotel, New Orleans, La.

The Public Utilities Association of Virginia
Pres.—T. Justin Moore, Va. Elec. & Power Co., Richmond, Va.

Wisconsin Utilities Association
Pres.—A. J. Goedjen, Wisconsin Public Service Corp., Green Bay, Wis.
Exec.-Sec.—J. N. Cadby, 135 West Wells St., Milwaukee, Wis.

Thirteenth Annual Convention of the American Gas Association
Atlantic City, N. J. - - - October 12-16, 1931

Personnel Service

SERVICES OFFERED

Gas engineer (B.S. and M.E.) with thirteen years' diversified experience in coal and water gas production, distribution and plant erection followed by eight years in plant design, economic surveys and utility appraisals. Strong background of research work and experience as instructor. **441.**

Research chemist, university graduate, M.S. (33). Ten years' government and industrial research experience in gas and related fields. Plant testing, experimental plant operation, and the development of new products. Gas purification, bituminous coatings, coal tar refining, high-pressure hydrogenation, and other problems. **442.**

Superintendent, assistant or general foreman with over twenty-five years' experience in coal and water gas manufacture and general plant maintenance. Applicant willing to go anywhere and will guarantee good results. **444.**

Manager and engineer, technically sound, well educated with unusually varied experience of twenty years; thorough understanding of economics of different processes including reforming of natural gas and oil-gas, by-product utilization, raw materials and unit costs. Accustomed to planning and carrying out improvements and making high- and low-pressure distribution layouts. **445.**

Manager with twenty-three years' experience in all phases of manufactured gas business desires position as manager of small property or assistant to manager of large property. Will consider position to take charge of Operation or Construction Department. **447.**

Industrial and natural gas engineer (33), technical graduate, ten years' practical experience in production, geology, industrial natural gas sales, utilization, and market surveys. Can obtain results in competitive industrial applications and promote company-customer good will. Desires connection where wide range of experience will be of mutual benefit. **449.**

Gas sales engineer (35), engineering graduate, desires executive, engineering, or sales position. Eight years' experience in operating, rate, house heating, and industrial gas departments with company having 45,000 meters. Capable of taking charge of industrial gas and house heating department. Extensive rate experience. **452.**

Gas range salesman with a clean record. Eight years with last employers. Have large acquaintance with utility and department store merchandisers in the middle-west states. Will consider a connection with a live and progressive manufacturer. **453.**

Manufacturers' representative in the Chicago district desires an additional non-conflicting line. Thoroughly established. Prefers foundry, furnace or heating equipment. **456.**

Staff accountant, experienced in cost and rate analyses, preparation of rate schedules, statistics and special accounting and economic studies of utility operation, desires position in similar work. Twelve years' experience. Age 32, single. No objection to travelling or location. **458.**

Utility sales manager with a number of years' experience with gas companies in the East and Mid-West would like to connect with a manufacturer of high-grade gas appliances with a view to introducing the product among utilities, where he has an extensive acquaintance and thorough knowledge of the business. **459.**

Mechanical engineer, Stevens, 1919, graduate. Five years' experience in sales, sales management and design of heating, ventilating and drying equipment; seven years' experience in inspection, testing, research and development of mechanical equipment for large oil company. **460.**

Manager, with well rounded experience, both practical and technical, covering economical operation, high- and low-pressure distribution, construction, public relations, rate structure and sales. Have built up several run down properties. Desire position as manager or assistant to executive. **461.**

University man with exceptional practical and technical training and long experience in heavy **industrial** uses of gas (any source) industrial relations, and in the various phases of **sales** work, seeks responsible position with large utility, a wholesaler of gas to utilities, combustion engineering concern, or manufacturer. In close touch with latest flaming methods. Thoroughly competent in sales or development work. Employed. Arrange for interview. **462.**

SERVICES OFFERED

Chemical engineer (B.S.) twenty years' varied experience as technical executive and in research on manufacturing plant problems as well as preparation of statistics, and technical reports, cost reports, etc., desires connection of a technical or business nature in plant or field with company engaged in the development and distribution of natural gas. **463.**

Graduate **engineer**—experienced in design, construction and operation of transmission lines, medium- and low-pressure distribution plants, in both manufactured and natural gas; desires position with operating or engineering company. **464.**

Assistant to Executive—Technical and legal training (LL.M.) twenty years' practical experience in engineering, public relations, taxation, public utility rate-making and banking. **465.**

Gas engineer, M. I. T. graduate (32) ten years' practical experience as superintendent of plant with coal and water gas, distribution high- and low-pressure, construction and operation of new gas equipment. Desire position as manager or superintendent of plant or distribution. **466.**

Engineer (24) college man, four years' practical experience with midwest manufacturer of gas appliances. Experienced in design, manufacture, testing, installation and selling gas furnaces, space heaters and gas conversion burners. Desires position with manufacturer, gas company or dealer. **467.**

Engineer (31) eight years' varied experience with a large utility. College graduate; single; location immaterial. Utility or sales position desired. **468.**

Manager, at present employed, desires to connect with a substantial and established natural gas company. Have had exceptional experience in operating group properties, manufactured and natural gas and electric. Am an economical and conservative operator and can produce new business. **469.**

Connection desired as **sales director** or Eastern **sales manager** with progressive gas appliance manufacturer. If you have an approved and suitably priced article of real commercial merit, I can establish the market. I offer you extensive contacts within the public utility industry plus experience in every important phase of the sales promotional field. **470.**

Engineer, experienced in development of natural gas project from production to sales. Can block acreage, purchase or drill for gas, determine potential market, design and construct pipe line, negotiate sales of gas. Desires opportunity and backing from parties able to carry through a utility investment plan. **471.**

Salesman (35), six years' experience retailing domestic gas appliances for public utility desires position with gas company or manufacturer, would prefer to specialize on sale of automatic water heaters or ranges. Will go anywhere. Married. **472.**

Advertiser with twenty-four years' experience as solicitor, commercial agent and **manager** of five small gas companies is available for any position commensurate with ability. Experience includes manufacture coal and water gas, high- and low-pressure distribution, sales campaigns and office detail. Age 43, and married. **473.**

Industrial sales engineer, experienced in all branches of industrial furnace application, including surveys, sales and competitive fuel situations, as well as furnace operation; wide experience in both natural and manufactured gas installations; thorough understanding of general sales policies and methods of procedure. Eastern location preferred. **474.**

House heating sales engineer (35) assistant to manager house heating department, large suburban gas company. Thorough working knowledge coal, oil and gas-fired boilers including necessary controls and computation radiation (and operating cost) by transmission and degree day methods. Familiar all details installation and subsequent servicing. **475.**

POSITIONS OPEN

Gas range superintendent wanted for modern Eastern gas range plant. Must be capable of taking complete charge of production and enameling. Good opportunity for thoroughly experienced executive. State qualifications fully. Information will be held strictly confidential. **0223.**

Industrial gas sales engineer to conduct research on industrial gas applications and aggressively canvass for New Business. Location—New York State. Technical graduate preferred, with experience in Industrial Department of Gas Company. Age—preferably 30-35. State age, experience in detail and salary expected. **0224.**

Sales engineer to represent manufacturer of industrial gas combustion equipment in New England territory. Someone living in territory with knowledge of industrial gas application and willing to work in exclusive territory on straight commission basis. **0225.**

A very desirable connection is available to a young and energetic **engineer** with executive ability as Vice-President in charge of operations of a public utility corporation supplying natural gas to domestic and industrial consumers; must be capable of designing and installing high- and low-pressure systems and general management. To qualify as company executive requires a nominal investment. Give full details in first letter as to age, references and salary expected. All replies held in strictest confidence. **0226.**

Secretary—male stenographer with some knowledge of accounting and utility methods to work with manager of gas and electric company. Good opportunity for right man. **0227.**

Research chemist by well-established company manufacturing special protective coatings for underground and under water steel structures. Products are usually of bituminous base, but while some knowledge of such products is desirable, a more important requirement is a wide knowledge of materials in general. He will have two or three assistants. Company is a leader in its field and there is a good future for the right man. Salary commensurate with ability and results. Location vicinity of New York. Give full particulars and salary expected. **0228.**

THE PERSONAL INTERVIEW

Once a year the opportunity presents itself for the prospective employer and employee to get together at the Annual Convention, with a minimum of trouble and expense to both.

If any SERVICES OFFERED advertisement in this issue interests an employer the full details of the supporting Confidential Classification Record may be inspected during the Convention at Booths 821 and 822. If the advertiser is in attendance Personnel Service will be glad to establish contact and arrange an interview for the interested parties. Similar service will be rendered to the advertisers of POSITIONS OPEN should they desire to interview any applicants therefor.

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